



# Utah

## Comprehensive Wildlife Conservation Strategy



Effective October 1 2005–2015



# **UTAH COMPREHENSIVE WILDLIFE CONSERVATION STRATEGY (CWCS)**

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## **EXECUTIVE SUMMARY**

Over the past several decades, documented declines of wildlife populations have occurred nationwide. In Utah, the complexities of the geology and climate result in biologically diverse habitats that have historically supported approximately 700 species of vertebrate wildlife. However, introduction of non-native plant and animal species, changes in land management practices, and habitat loss and fragmentation have altered Utah's wildlife communities. Like other states, Utah is now facing reductions in native wildlife populations. The State Wildlife Grants (SWG) program was created by Congress in 2001 to provide states and territories with federal dollars to support conservation aimed at preventing wildlife from becoming endangered and in need of protection under the Endangered Species Act (ESA). Comprehensive Wildlife Conservation Strategies (CWCS) have been developed by every state and territory to ensure that SWG funds are spent to effectively restore and enhance wildlife populations and their habitat, and prevent the need for additional listings on the Endangered Species List.

Conservation and management of wildlife throughout the state of Utah, in light of growing environmental pressures, will require broad public support for, and involvement in, conservation efforts. Therefore, when the Utah Division of Wildlife Resources (UDWR) initiated its Draft CWCS in 2002, nine public and private entities were solicited for active participation in the plan's development. This group of organizations acts as the Partner Advisory Group to the UDWR and has been and will continue to be essential in the development and implementation of Utah's CWCS. Since the formation of the Partner Advisory Group, UDWR has made efforts to incorporate the comments and concerns of additional stakeholders, including Indian Tribes, local governments, local and regional interest groups, and non-profit organizations, and many of these have committed to advising the UDWR. In addition, UDWR has encouraged public participation through two legislated processes: Regional Advisory Councils and the Utah Wildlife Board.

To address wildlife species in the CWCS, UDWR adopted a three-tiered system that defines and prioritizes Utah's native animal species according to conservation need. Tier I includes federally listed species and species for which a Conservation Agreement has been completed and implemented. Tier II species include those listed on the Utah Species of Concern List under sole state authority. Tier III includes species that are of conservation concern because they are linked to an at-risk habitat, have suffered marked population declines, or there is little information available regarding the ecology or status of the species. The tiered ranking system provides a perspective for wildlife managers to prioritize conservation activities. A parallel process to identify the most valuable habitat types for sensitive species statewide was developed through dialog between the Partner Advisory Group and UDWR. As a result, the CWCS describes the ten most at risk habitat types (out of 24) found in Utah, specifying their relative priority based on the degree of threat faced by each habitat type and the presence of prioritized species.

After identifying species and habitats of greatest conservation need, UDWR wildlife and habitat managers identified the general and specific threats associated with priority species and habitats. These threats were reviewed and revised by members of the Partner Advisory Group. The Partner Advisory Group also identified and prioritized general and

specific conservation actions to manage these threats so that the CWCS will be more useful in directing on-the-ground conservation activities for priority species and habitats.

While the CWCS provides a framework for conservation, actual implementation of conservation actions will require the cooperation and coordination of affected stakeholders and resource managers. At an organization or agency level, actions recommended in the CWCS can be incorporated into planning efforts and management practices. Based on the CWCS, the UDWR, the Partner Advisory Group, and additional stakeholders will cooperatively develop implementation priorities. As conservation actions are implemented, adaptive management will be used to promote continual improvement of conservation through learning from past conservation actions. Adaptive management must contain a monitoring component that assesses species and habitat responses to management actions while simultaneously measuring environmental conditions that may confound monitoring results. As ongoing conservation actions are implemented and new actions are developed the CWCS will be used as a guide so that study design, evaluation, and adaptive management are thoroughly integrated into UDWR and Partner projects.

The CWCS, through review and adaptation, will be an evolving document. For the CWCS to be adopted, implemented, and adapted over the next decade, the UDWR must facilitate a statewide, regional and local dialog between agencies, organizations, stakeholders, and citizens. The UDWR and its partners will convene annually in the next ten years to review and consider the status of efforts made through the CWCS, and additional evaluations will take place as needed. At the mid-point of CWCS implementation, UDWR and partners will discuss and readjust conservation efforts to more effectively progress towards the 10-year horizon of the plan. In ten years, a new CWCS will be drafted based on new data and will reflect adjustments made through adaptive management.

The CWCS addresses species and habitats of conservation need and the necessity of partner and public involvement to effectively implement future conservation actions. Chapter 1 outlines the purpose of the CWCS. Chapter 2 presents the approach for including the public, stakeholders and partners. Chapter 3 addresses Partners' authorities and missions and coordinating their involvement with the CWCS. Chapter 4 outlines the State of Utah's efforts to merge the CWCS with other strategic plans, and lists other federal, state, and regional plans to which the CWCS will be linked. Chapter 5 outlines the approach used to identify species in greatest need of conservation while Chapter 6 provides information about species abundance and distribution and identifies threats and proposed conservation actions for those species. Priority habitats and their condition are identified in Chapter 7 and Chapter 8 describes problems, threats, and conservation actions for those habitats. Chapter 9 discusses plans for monitoring conservation success through identifying measures and then tracking our effectiveness and ability to adapt to changing conditions. Finally, Chapter 10 describes the proposed process for biennial plan review.

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## **CHAPTER 1 . INTRODUCTION AND PURPOSE**

### **PURPOSE OF THE COMPREHENSIVE WILDLIFE CONSERVATION STRATEGY**

Populations of many species of wildlife have declined over the past 30 years. These declines are due to a variety of man-made and natural factors. To date, limited conservation efforts have been directed towards these issues, in large part due to the lack of information regarding the ecology of the species involved and the lack of reliable funding. Unless adequate measures are taken to recover and conserve species populations and habitats, some of these species may become federally listed in the future. The purpose of the Comprehensive Wildlife Conservation Strategy (CWCS) is to direct the integration and implementation of ongoing and planned management actions that will conserve native species and thereby prevent the need for additional listings.

### **OVERVIEW OF UTAH**

Five physiographic regions, defined by topography, geologic structure, and elevation occur within Utah: Basin and Range Region (western one-third of state); Mojave Desert (extreme southwest); Utah Mountains (Uinta and Wasatch mountain ranges); Colorado Plateau (southeastern portion of state); and Wyoming Basins (northeast portion). Utah's climate varies with elevation, ranging from semi-arid desert to montane. Average annual precipitation ranges from less than eight inches to more than 50 inches of water per year. Most precipitation falls in the mountainous regions of the state while more than two-thirds of the state receives less than 12 inches of total precipitation per year. Drought, as measured by the Palmer Drought Severity Index, has differed substantially over the last 25 years. In general, the period from 1977-86 did not have drought conditions while the next 15 plus years, 1987-2003, have been characterized by long-term drought.

The complexities of Utah's geology and climate result in biologically diverse habitats. Important habitat types in Utah include lowland riparian, wetland, mountain riparian, shrubsteppe, mountain shrub, lotic, wet meadows, grasslands, lentic, aspen forests, and desert scrub. Riparian areas are the richest habitat type in terms of biodiversity and wildlife abundance. Aspen communities provide a number of ecosystem values including watershed protection and improved water yields, and are second to riparian areas in wildlife species diversity and abundance.

The state of Utah is renowned for the biodiversity associated with the Great Salt Lake Ecosystem, which is a high priority landscape for the Utah Division of Wildlife Resources (UDWR). The Great Salt Lake is a desert oasis for migrating birds and some species that visit the lake are salt lake specialists that rely upon the unique biota in and around the lake. The water elevation in this terminal basin lake is ever changing along with the habitats and has fluctuated from 4192 to 4212 feet above sea level since 1850, when record keeping was initiated. Indeed, this constant change ensures the long-term survival of the lake's changing habitats and the bird species that frequent those habitats. The importance of this natural mechanism cannot be overstated.

Utah's habitats support diverse wildlife communities and approximately 700 species of vertebrate wildlife and thousands of species of invertebrates have been known to occur in Utah within historical times – or since the mid-1800s. This includes species that are extinct, extirpated, accidental, and introduced. Almost 250 species of birds utilize habitats within the Great Salt Lake Ecosystem alone. Law defines wildlife in Utah as crustaceans, mollusks, and vertebrate animals living in nature (Utah Code Annotated 23-13-2(49), Appendix A). All other members of the animal kingdom are not jurisdictional wildlife in Utah and therefore cannot be legally addressed by the agency in this strategy (i.e., the legislature has not given the agency authority to manage species not mentioned in law). Few crustacean species are found in Utah and these are of limited distribution. The most prominent of the crustaceans are the brine shrimp found only in the Great Salt Lake; these are managed by UDWR in a special project office. Because there are limited crustaceans in Utah and because UDWR does not anticipate that they will be of conservational concern over the next decade, they are not addressed further by this strategy.

## **Utah's CWCS**

In Utah, the wildlife community has changed dramatically in the last 150 years, primarily due to the introduction of non-native species (e.g., plants, livestock, game animals) and changes in land management practices, such as changes associated with agriculture, mining, and urban development. Conservation efforts for declining species have been limited by the lack of adequate funding. The number of vertebrate species identified by UDWR as wildlife “species of concern” increased from 64 in 1976 to 90 in 1998 and decreased to 74 in 2003 (due to new criteria). Altering land management practices without regard to the effects on wildlife poses a serious threat to Utah's species. Most of Utah's rangeland vegetation has significantly changed in quantity and quality since European settlement due to wildfire control, inappropriate or unmanaged grazing (bunch grasses have been replaced by desert shrubs and juniper), and introduced alien herbaceous species (e.g., Russian thistle and cheatgrass). The implication of more than six thousand acres of sagebrush that were documented in 2003 as either dead or dying in eastern, central and southern Utah, has serious consequences and challenges for maintaining rangeland health and habitat for sagebrush obligate species. Similarly, though aspen forests support abundant wildlife and protect watersheds, fire control and excessive browsing of young aspen have resulted in many acres of aspen being displaced by less productive coniferous forests.

With more than 1,000 species on the Federal Threatened and Endangered Species List, the United States clearly needs a robust program to address problems early to avoid costly, intensive recovery efforts. The amount of federal and state dollars needed to protect and restore federally listed species is far greater than would have been required to prevent their decline in the first place. Endangered and threatened wildlife are identified and managed under the U.S. Endangered Species Act, which sets specific guidelines for listing and management and is administered by the U.S. Fish and Wildlife Service (USFWS). Utah has, or historically had, 21 federally listed wildlife species (5 mammals, 5 birds, 8 fish, 1 reptile and 2 invertebrates). In addition, there are another 6 species in Utah that are either proposed for threatened and endangered listing or are candidate species (3 vertebrates and 3 invertebrates). The UDWR participates in most recovery efforts as a cooperator with the USFWS. Historically, recovery

programs have focused on a single species but more recently have addressed multiple species and critical habitats.

United States laws and policies place the primary responsibility for implementing wildlife management programs on the States, but effective implementation depends on Congressional monetary support. For decades, federal funding to the states has focused primarily on, and has been largely responsible for, enormously successful programs ensuring conservation and sustainable use of important wildlife species hunted or fished by millions of sportsmen across America. There has been a serious gap in federal funding for many species not addressed by hunting and fishing fees and excise taxes, though limited funding has been available for recovery of threatened and endangered species.

State Wildlife Grants (SWG) are relatively new and were created under a federal program that was designed to fill this gap by providing funding to the states to prevent species from declining and becoming federally listed. This marks the first time the federal government has provided substantial funding to address this problem. SWG were established as part of the Conservation Trust Fund. Currently SWG are funded based on an annual congressional appropriation (see Appendix B for the State Wildlife Grants portion of Public Law). According to the SWG program, each State, Territory, and the District of Columbia must complete a Comprehensive Wildlife Conservation Strategy (CWCS) by October 1, 2005 to be eligible for funding. The purpose of the CWCS is to direct the integration and implementation of ongoing and planned management actions that will conserve native species and thereby prevent the need to federally list additional species. The USFWS approves CWCSs and administers SWG funding.

## **REQUIRED ELEMENTS OF CWCS**

Congress identified eight required elements to be addressed in every CWCS (see below). Further, the plan must identify and be focused on the “species in greatest need of conservation,” yet address the “full array of wildlife” and wildlife-related issues. The CWCS must provide and make use of:

- (1) Information on the distribution and abundance of species of wildlife, including low and declining populations, as the State fish and wildlife agency deems appropriate, that are indicative of the diversity and health of the State’s wildlife;
- (2) Descriptions of locations and relative condition of key habitats and community types essential to conservation of species identified in the 1<sup>st</sup> element;
- (3) Descriptions of problems which may adversely affect species identified in the 1<sup>st</sup> element or their habitats, and priority research and survey efforts needed to identify factors which may assist in restoration and improved conservation of these species and habitats;
- (4) Descriptions of conservation actions determined to be necessary to conserve the identified species and habitats and priorities for implementing such actions;

- (5) Descriptions of the proposed plans for monitoring species identified in the 1<sup>st</sup> element and their habitats, for monitoring the effectiveness of the conservation actions proposed in the 4<sup>th</sup> element, and for adapting these conservation actions to respond appropriately to new information or changing conditions;
- (6) Descriptions of procedures to review the Strategy/Plan at intervals not to exceed ten years;
- (7) Descriptions of the plans for coordinating, to the extent feasible, the development, implementation, review, and revision of the Plan-Strategy with Federal, State, and local agencies and Indian Tribes that manage significant land and water areas within the State or administer programs that significantly affect the conservation of identified species and habitats; and
- (8) Descriptions of the necessary public participation in the development, revision, and implementation of the Plan.

The CWCS development and implementation process is an opportunity for state wildlife agencies to provide effective and visionary leadership in conservation. It is also an opportunity to address broader issues and programs, such as education and recreation related to wildlife and habitats, which can enhance conservation efforts and funding. Involving partners that share interest in such programs will likely increase public support for wildlife conservation (Chapters 2 and 3).

## **STRUCTURE OF THE CWCS**

Utah's CWCS was prepared emphasizing three guiding principles:

1. Use a public-private partnership to develop the strategy, which has been accomplished through our Partner Advisory Group.
2. Use the best science and knowledge available.
3. Use the CWCS as a foundation for conservation efforts and focus energy on implementing actions contained in the strategy.

The remainder of the CWCS addresses the eight required elements (Table 1.1) using the species/habitat approach. Chapter 2 presents the approach for including the public, stakeholders and partners in CWCS development (Elements 7 and 8). Chapter 3 addresses Partners' authorities and missions and coordinating their involvement with the CWCS (Elements 7 and 8). Chapter 4 outlines the State of Utah's efforts to merge the CWCS with other strategic plans (Element 7), and lists other federal, state, and regional plans to which the CWCS will be linked. Chapter 5 outlines the approach used to identify species in greatest need of conservation (Element 1) while Chapter 6 provides information about species abundance and distribution (Element 1) and identifies threats and proposed conservation actions for those species (Elements 3 and 4). Priority habitats and their condition are identified in Chapter 7 (Element 2) and Chapter 8 describes problems, threats, and conservation actions for those habitats (Elements 3 and 4). Chapter 9 discusses plans for monitoring conservation success through identifying

measures and then tracking our effectiveness and ability to adapt to changing conditions (Elements 5 and 6). Finally, Chapter 10 describes the proposed process for biennial plan review (Elements 6, 7, and 8).

**Table 1.1. Locations of Required Elements in the CWCS**

<b>Required Element</b>	<b>Chapters</b>
1 – Distribution and abundance of wildlife species	5, 6
2 – Locations and condition of key habitats	7
3 – Problems that may adversely affect species and habitats	6, 8
4 – Conservation actions that may conserve species and habitats	6, 8
5 – Proposed plans for monitoring species and habitats	9
6 – Procedures to review the CWCS	9, 10
7 – Coordinating with other land management agencies	2, 3, 4, 10
8 – Public participation	2, 3, 10

## **CHAPTER 2 . PUBLIC AND PARTNER INVOLVEMENT**

(Elements 7 and 8)

### **PARTNERS AND STAKEHOLDERS**

The mission of the Utah Division of Wildlife Resources (UDWR) is to ensure the future of wildlife for its intrinsic, scientific, educational, and recreational values. This mission is accomplished through the protection, propagation, management, and conservation of wildlife throughout the state. Accomplishing this goal, in light of growing environmental pressures and impacts associated with habitat degradation and loss, requires broad public support for, and involvement in, conservation efforts.

UDWR initiated the planning effort for the Comprehensive Wildlife Conservation Strategy (CWCS) by soliciting active participation from government and non-governmental organizations in developing and implementing the plan. Conservation partners and stakeholders include such entities as federal and state agencies, Indian Nations, nongovernmental groups, local (i.e., county and municipal) governments, significant national interest groups with state-based chapters, state-specific interest groups as well as locally based groups, professional associations and societies, peripheral cooperators, commercial businesses with vested interests, and corporations (Appendix C). The CWCS Coordinator and various associated UDWR staff have scheduled CWCS presentations, discussions, and events with multiple stakeholders across the state (see Appendix D for organizations and agencies contacted about the strategy). In 2004, 16 such activities occurred and in 2005, 29 such activities have occurred thus far. It is UDWR's intent to continue these outreach activities throughout the year and for the life of the CWCS in order to increase participation and awareness and stimulate implementation.

Ten specific entities made up UDWR's Partner Advisory Group and these entities have been instrumental in the development of the CWCS by providing key information to be included in the strategy and through strategy review, insuring that the interests of various stakeholders have been addressed. These organizations will be strongly encouraged to incorporate the CWCS into their own management and conservation plans and aid the UDWR in regional and local implementation throughout the state. Thus, the development and implementation of Utah's CWCS has been, and will continue to be, a collaborative and comprehensive effort.

Although no public announcement or recruitment of formal public input beyond the Sensitive Species Rule and the Regional Advisory Council (RAC) and Wildlife Board processes is mandated by law (see below), a variety of methods or techniques were applied to engage the public and other stakeholders in developing the CWCS. During late Fall 2004 and Winter 2005, the UDWR visited with major stakeholders, presenting the rationale, process and current status of efforts to develop and finalize the CWCS in time for Wildlife Board approval no later than early Summer 2005. UDWR announced, by way of invitations issued to all of its stakeholders and the general public, the opportunity to review a draft of the CWCS in Spring 2005. In essence, an invitation was made for stakeholders to become involved in the review and completion of the final version of the CWCS and then assist the UDWR and its major partners its implementation over the next 10 years. Recommendations and policy regarding management and conservation of wildlife species will be based on species needs as defined in the CWCS. The public is welcome to comment on such recommendations and policy, and thus help implement the CWCS.



## LEGISLATED PUBLIC PARTICIPATION

In addition to partnerships solicited specifically for the CWCS, the UDWR is subject to two legislated processes that encourage public participation in decisions regarding wildlife and habitat, including the development and approval of the CWCS. These are:

- 1) Regional Advisory Councils and Utah Wildlife Board (for Utah Code establishing these entities, see Appendices E and F, respectively); and
- 2) Utah's Designation of State Species of Concern (Appendix G).

These processes are ongoing and will continually enable citizens to maintain their involvement throughout the 10-year duration of the initial CWCS and subsequent revisions. Other non-legislated means for public involvement exist and have also been pursued and implemented (Appendix H).

### Regional Advisory Councils and Utah Wildlife Board Processes

In the early 1990s, the process for directing and guiding wildlife management in Utah was dramatically overhauled, and the organization and administration of the UDWR were restructured. In each of the five administrative regions within the state, a Regional Advisory Council (RAC) was established to recommend actions and advise the Utah Wildlife Board in wildlife and habitat management decisions (R657-39). The fifteen members of each RAC include either one or two representatives of agriculture, sportsman, nonconsumptive wildlife, locally elected public officials, the U.S. Forest Service, the Bureau of Land Management, and Indian Tribes (where appropriate). Membership also includes two members of the public at large who represent the interests of the region.

RAC meetings are open to the public, and the councils encourage citizen attendance through public notice of the agenda, date, time and location of each meeting, at the regional UDWR office and through the local media. The UDWR encourages public participation and citizens are welcome to address the council with their concerns; their testimonies are recorded in the minutes of the meeting. The RACs gather and compile information from UDWR staff, the public, and government agencies before making recommendations to the Wildlife Board.

The Utah Wildlife Board (Board) establishes policies designed to fulfill the intent of all laws pertaining to wildlife, and accomplish the preservation, protection, conservation, perpetuation, introduction, and management of wildlife in Utah. The Board is composed of seven members, appointed by the governor, that have expertise or experience in at least one of the following: 1) wildlife management or biology; 2) habitat management, including range or aquatic; 3) business, including knowledge of private land issues; or 4) economics, including knowledge of recreational wildlife uses. In developing wildlife policy, the Board considers the recommendations of each RAC and UDWR personnel but may reject recommendations with written explanation. Similar to RACs, the Board has open meetings where public comment is welcome prior to the finalization of any policy decisions.

Utah's CWCS was directed through these channels as it was developed. Draft versions of the document were open to review by Partner Advisory Group members, the public, stakeholders, and the United States Fish and Wildlife Service (USFWS) via the Internet. RACs also reviewed the plan and heard comments from the public, before making recommendations to the Board. Before final approval, the Board, again, requested and reviewed public comments. Our submission of the CWCS to the USFWS National Acceptance Advisory Team (NAAT) for

formal review, critique, and potential acceptance, follows endorsement of the CWCS by the RACs and Utah Wildlife Board on June 7, 2005.

### **Utah's designation of State Species of Concern process**

The Wildlife Species of Concern and Habitat Designation Advisory Committee (Committee) was established in 2001. The Committee is composed of the Executive Director of the Utah Department of Natural Resources (UDNR) and Directors of three Divisions: Wildlife Resources; Oil, Gas and Mining; and Water Resources. The purpose of the Committee is to review all proposed designations or re-designations of each wildlife species of concern, or those species for which there is credible scientific evidence to substantiate a threat to continued population viability. Species accepted by this committee as state Species of Concern are automatically included as Tier II species in the CWCS. All Federal Threatened, Endangered, and Candidate species, as well as state Conservation Agreement Species, are considered state sensitive as Tier I species in the CWCS.

The Committee encourages public participation in this process in that any citizen is welcome to petition for a species' inclusion, request extensions to review a proposed Committee action, or request to make an oral presentation before the Committee. Though public concerns and petitions are considered, designation of a species as one of concern will only occur if sufficient scientific evidence warrants that action. The UDNR Executive Director then makes a formal written recommendation to the Wildlife Board for final approval as a State Species of Concern.

### **OTHER CITIZEN PARTICIPATION OPPORTUNITIES**

As the UDWR moves into the first decade of its CWCS, efforts will be made to engage citizens, stakeholders and potentially affected interests in enhancing their awareness, interest and potential participation in the implementation of conservation actions. The UDWR hopes to foster communities of practice, in which members are responsible for and engage in conservation, land stewardship, and an environmental ethic. Although there is no requirement for the CWCS to specifically address education and outreach activities, the UDWR recognizes the importance of these efforts and the objectives below have been generated to address this need.

- a.* Distribute information on and provide expertise in enhancing protected wildlife populations and restoring their habitats;
- b.* Stimulate, develop, acknowledge and recognize the implementation of ecosystem stewardship statewide, especially for species and habitats of conservation need;
- c.* Regularly communicate with partners about UDWR wildlife and habitat management plans and their application in the field;
- d.* Develop and offer hands-on and/or interactive learning opportunities, events and activities to enable a personal experience; and
- e.* Provide information through personal and nonpersonal media and promote public participation in and awareness of wildlife-related issues and funding needs of the UDWR.

To accomplish these objectives, UDWR has helped to initiate several programs to educate public citizens about sensitive species and habitats (Appendix H).

## **CHAPTER 3 . COORDINATING CWCS EFFORTS WITH AGENCIES AND ORGANIZATIONS**

(Elements 7 and 8)

### **DEVELOPMENT AND REVIEW**

The overall process of Comprehensive Wildlife Conservation Strategy (CWCS) development and review required the cooperation and coordination of efforts by various organizations and agencies that have a role in managing portions of Utah's land or conserving Utah's wildlife species. Thus, the development and review of the CWCS has become a "collaborative" process.

Ten specific entities were invited to help draft Utah's CWCS. These included governmental entities, specifically: United States Forest Service (USFS), Bureau of Land Management (BLM), United States Fish and Wildlife Service (USFWS), Natural Resources Conservation Service (NRCS), Utah Department of Natural Resources (UDNR); and nongovernmental entities, specifically: the Utah Farm Bureau Federation, Sportsmen for Fish and Wildlife, The Nature Conservancy, Trout Unlimited, and the Utah Audubon Society. Each of these partners was invited to attend all CWCS development and review meetings.

Through the public comment period the Utah Division of Wildlife Resources (UDWR) recognized the need for further collaborative efforts in developing a process for implementing this strategy. We have identified additional potentially affected interests that desire to participate and contribute in several areas. Specific commitment to participating in devising the process of implementation has been expressed by the Utah Association of Counties (including several county commissioners throughout the state), the Utah Cattlemen's Association, and the Utah Woolgrowers Association. Other nongovernmental entities (e.g., Rich County Coordinated Resource Management, Quality Resource Management, Deseret Land and Livestock) have indicated their interest in not only reviewing the science aspects of monitoring and evaluating projects pre- and post- implementation to assess their degree of success, but also in sponsoring and possibly participating in such assessments.

Stakeholder solicitation (Chapter 2) will continue while the processes of implementation and monitoring/evaluation are being devised and carried out. These processes will be subject to review by all vested stakeholders as well as the original ten-partner group. Stakeholders that do not choose to actively participate will be updated on the research and implementation progress of the CWCS through direct and indirect contact. Additionally, a web site devoted to the CWCS will be maintained and readily available to inform partners and the public of our progress toward specified goals and outcomes.

### **FEDERAL, STATE, AND LOCAL AGENCIES AND INDIAN TRIBES**

Many constituents of the UDWR and state citizens are interested in effecting positive change on the publicly owned forest and range habitats essential for the health of wildlife populations (e.g., enhancing sagebrush steppe for wintering mule deer herds or sage grouse recolonization). Much of Utah's publicly owned landscape is managed by two federal agencies: USFS and BLM. In addition, the USFWS manages three National Wildlife Refuges (Ouray, Fish Springs, and Bear River) in Utah. Some state entities also have public land management authority, such as the School and Institutional Trust Lands Administration (SITLA). These land management entities have different ways to develop plans that affect wildlife habitat. In addition, some private

organizations, such as The Nature Conservancy and The Audubon Society, are also committed to the conservation of habitats essential for fish and wildlife population viability and have developed Ecosystem Plans or Ecological Assessments for various geographically or ecologically defined systems.

All of the following entities profiled are involved in currently on-going partnership projects with the UDWR. The CWCS is being made available to these entities, and incorporation of the CWCS into their respective planning processes will be encouraged.

## **Federal Agencies**

*Bureau of Indian Affairs (BIA).*—The BIA actively encourages and trains Indian people to manage their own affairs under a trust relationship to the Federal Government, and facilitates full development of their human and natural resource potentials.

*Bureau of Land Management (BLM).*—The BLM manages approximately 23 million surface acres of public land in Utah. Their mission is to sustain the health, diversity, and productivity of these lands. The BLM operates ten Field Offices, two Field Stations, and one National Monument in Utah, each of which periodically revises its Land Use Plan. The field offices currently (2005) revising their RMPs include Kanab, Moab, Monticello, Price, Richfield and Vernal.

*Bureau of Reclamation (BOR).*—BOR is a contemporary water management agency that has initiated programs and activities to assist Western States, Native American Tribes and others to meet water needs and balance the multitude of competing uses of water, while protecting the environment and the public's investment. The BOR develops and implements both strategic and annual plans that align agency resources with program objectives.

*Department of Defense (DOD).*—With exceptions as defined in the Endangered Species Act the DOD is subject to federal environmental regulations regarding environmental quality standards and protection of federally listed species. Both Hill Air Force Base and Dugway Proving Ground have wildlife management plans and research objectives in place to benefit sensitive species.

*Environmental Protection Agency (EPA).*—The EPA awards money to states for non-point source pollution control in watersheds. EPA funding has been used to address problems, including sediment loading, bacterial contamination, soil erosion, and riparian area degradation along the Bear River watershed in northern Utah. EPA is also a member of the Colorado Plateau Ecosystem Partnership, which addresses environmental concerns such as threatened and endangered species and maintaining wilderness.

*National Park Service (NPS).*—The NPS seeks to preserve, protect, and manage biological resources and related ecosystem processes in the National Park System so that future generations may enjoy them. The NPS manages five national parks, seven national monuments, and two national recreation areas in the state of Utah. The management of each park is guided by natural resource management plans, which guide management practices of fire, vegetation, and wildlife. These plans must be revised every 10-15 years.

*Natural Resources Conservation Service (NRCS).*—The NRCS provides assistance to land owners, communities, units of state and local government, and other Federal agencies in planning and implementing conservation systems. The purposes of the conservation systems are to reduce erosion, improve soil and water quality, improve and conserve wetlands, enhance fish and wildlife habitat, improve air quality, improve pasture and range condition, reduce upstream

flooding and improve woodlands. NRCS and partnering agencies administer a broad range of programs to assist farmers, ranchers, and other landowners in conserving natural resources. Many of these programs identify conservation of at-risk species and their habitat as a priority. These programs provide incentives such as technical and cost-sharing assistance to install conservation practices. The CWCS will be used to help direct program funds to assist in the conservation of priority species and habitat types.

*United States Fish and Wildlife Service (USFWS).*—The USFWS helps protect a healthy environment for fish and wildlife at the federal level, through administration of the Bear River Migratory Bird Refuge, and Fish Springs and Ouray National Wildlife Refuges. As most national refuges were established to protect the habitat and survival of wildlife species, the USFWS operates these refuges under conceptual management or comprehensive conservation plans. Comprehensive plans were completed for the Bear River Refuge in 1997, Ouray in 2000, and Fish Springs in 2004. The National Wildlife Refuge System Improvement Act of 1997 requires these plans to be revised every 15 years, and plans must be consistent with fish and wildlife conservation plans of the State in which the refuge is located.

*United States Forest Service (USFS).*—The land use plans of the USFS outline broad goals and priorities for forest management so that forest resources are used in a sustainable manner to provide a variety of products and use opportunities for current and future generations. Forest plans must be revised every 10-15 years to keep up to date with changing natural and social conditions, scientific knowledge and laws. The USFS administers six national forests in Utah: Uinta, Ashley, Wasatch-Cache, Fishlake, Manti-LaSal, and Dixie. Each of these forests has a published Forest Plan that provides management direction for the many uses of a national forest including, outdoor recreation, range, timber, watershed, fish and wildlife, minerals, wilderness, and cultural resources. Currently, Ashley, Manti-LaSal, Dixie, and Fishlake National Forests are revising their forest plans. Revisions for Uinta and Wasatch-Cache National Forests were completed in 2003.

## State Agencies

*Community Based Conservation Extension Specialists (CCES) and Utah State University Extension (USUEXT).*—With a history of local involvement in the community, non-regulatory status, and a good relationship with local ranchers and farmers, USUEXT entered into a long term agreement and contract with the UDWR to develop a process to involve local communities in sensitive species conservation. UDWR and USUEXT believe this cooperative effort is necessary if local communities are going to be pro-active in resolving sensitive species and wildlife/natural resource issues. Presently, USUEXT is involved in intensive research and monitoring of local sage-grouse populations, and has hired CCES who are working cooperatively with the UDWR and other partners to facilitate and coordinate sage-grouse Local Working Groups (LWGs) in Utah. These groups are developing local sensitive species conservation plans and will utilize and implement the CWCS on local levels. These plans will identify strategies to improve rangeland habitat and watershed conditions, increase sage-grouse populations, and sustain local economies. Each plan contains information on the current status of area sage-grouse populations and rangelands, local community issues and concerns, and agreements or actions required to implement management strategies.

*Utah Department of Agriculture and Food (UDAF).*—The mission of UDAF is to protect and promote Utah’s agriculture and food. UDAF works with UDWR as a member of the Fish Health Policy Board by controlling the importation and release of aquatic species in the state. UDAF also helps to maintain wildlife and habitat health through investigations and control of diseases and introduced and noxious species.

*Utah Department of Environmental Quality (UDEQ).*—UDEQ is charged with maintaining the health of Utah’s land, air, and water resources. Within UDEQ, UDWR interacts with the Division of Water Quality to develop Total Maximum Daily Loads (TMDLs) for projects focusing on aquatic species and habitats. UDWR also works with the Division of Solid and Hazardous Waste (SHW) in site remediation for some species. UDWR is currently working with SHW in remediation of ground water contamination to conserve the fat-whorled pondsnail.

*Utah Department of Natural Resources (UDNR).*— The UDNR administers the Endangered Species Mitigation Fund (ESMF), which was created in 1997 to help state agencies, counties and private citizens comply with the Endangered Species Act of 1973. Additionally, the ESMF was intended to help develop species status assessments and species protection measures to prevent the need for future listings under ESA. The species account was fully funded in 2001 with approximately \$3 million annually to provide for participation in habitat conservation planning, fish recovery programs, and development and implementation of conservation agreements. Cooperation between other state and federal biologists, involvement of local and county officials, and direct participation of private interests have all been facilitated and improved by the new programs and actions afforded by the ESMF. The UDNR annually reviews UDWR proposals to utilize the ESMF directly or as a match for State Wildlife Grant funds, thereby helping to support objectives outlined in the CWCS for habitats and species of conservation need. In addition to administering ESMF funding, UDNR houses several state divisions that partner with or will potentially partner with UDWR on specific projects and programs. These divisions include: Water Rights; Water Resources; Oil, Gas, and Mining; Forestry, Fire, and State Lands; State Parks and Recreation; and the Utah Geological Survey. The CWCS can be integrated into guidance documents and operating plans of each of these divisions.

*Utah Division of Forestry, Fire and Lands.*—This division develops and participates in forest health, forest stewardship, and fire management programs to ensure long term sustainability of natural resources, including wildlife and habitats, on non-federal forest, range, and watershed lands.

*Utah Division of Oil, Gas and Mining.*—The Division of Oil, Gas and Mining regulates the exploration and development of coal, oil and gas, and other minerals in a manner which encourages responsible reclamation and development and protects the environment.

*Utah Division of Parks and Recreation.*—The Division of Parks and Recreation engages in planning efforts to guide short and long-term site management for each park within the system. Planning is needed to protect and interpret each park’s natural and cultural resource base, and ensure that resources, including wildlife and habitat, are sustainable for the enjoyment of future generations.

*Other Divisions within the Department of Natural Resources.*—Other state divisions include: 1) the Division of Water Resources which promotes the orderly and timely planning, conservation, development, utilization and protection of Utah's water resources; 2) the Division of Water Rights which administers the use of Utah's water based on established law and water rights by providing prompt, quality service and consideration

for public interest and the environment; and 3) the Utah Geological Survey which creates, interprets and provides information about Utah's geologic environment, resources and hazards to promote safe, beneficial and wise use of the land.

*School and Institutional Trust Lands Administration (SITLA).*—This administration provides for a statewide inventory of assets, including natural and cultural resources, on trust lands. Based on the inventory, the agency develops a statewide management plan that includes a five-year strategic plan, one-year tactical plans, and identification of appropriate performance measures. The UDWR will encourage SITLA to incorporate the CWCS into these management plans to account for affected species and habitats.

## **Local Governments and Agencies**

*Associations of Governments (AOGs).*—AOGs are voluntary organizations of local governments created to support intergovernmental cooperation and facilitate the coordination of federal, state, and local programs for the solution of mutual problems of a region. Utilizing combined resources, AOGs provide a means for planning and development of the physical, economic, and community resources of the region. AOGs in Utah include Bear River Association of Governments (Box Elder, Cache, and Rich Counties), Five County Association of Governments (Beaver, Garfield, Iron, Kane, and Washington Counties), Mountainland Association of Governments (Summit, Utah, and Wasatch Counties), Six County Association of Governments (Juab, Millard, Piute, Sanpete, Sevier, and Wayne Counties), Southeastern Utah Association of Governments (Carbon, Emery, Grand, and San Juan Counties), Uintah Basin Association of Governments (Daggett, Duchesne, and Uintah Counties), and Wasatch Front Regional Council (Davis, Morgan, Salt Lake, Tooele, and Weber Counties).

*Local Governments.*—The UDWR communicates with local government officials regarding project-level concerns by using the state's Inter-Governmental Review process administered by the State Resource Development Coordinating Committee (RDCC). Regional UDWR personnel also provide regular informal informational briefings to county commissioners as directed by regional supervisors or requested by local officials.

*Utah Association of Counties (UAC).*—The UAC is a voluntary, state-wide organization operated by the 29 counties of Utah. UAC aids counties in providing effective county governance to the people of Utah by offering a broad range of management and intergovernmental relations services to county commissioners and other county officials. UAC is dedicated to securing state and federal legislation and administrative action that is beneficial to the counties of Utah and to county residents, providing forums whereby county policy can be formulated so as to represent the interest of all counties and all elected offices in county government. This assures the continuance of a single, unified, strong voice for county governments in Utah, and enhances the professionalism of county officials and governments.

## **Native American Tribes**

Five major Native American Tribes reside in Utah: 1) Ute; 2) Dine' (Navajo); 3) Paiute; 4) Goshute; and 5) Shoshone. Together, these tribes manage more than 1.4 million acres of land in Utah. Some of these tribes have tribal Fish and Wildlife Departments that work in coordination with the UDWR on already existing conservation efforts. The UDWR is contacting individual

tribes, their Fish and Wildlife Departments, and councils to invite participation in implementing the CWCS on tribal lands.

### **Non-governmental Organizations**

*Sportsmen for Fish and Wildlife (SFW).*—SFW was organized to promote the protection and enhancement of wildlife habitat, the quality of wildlife management programs, and protection of America’s family heritage of hunting and fishing. SFW achieves objectives by working with state and national elected officials, private landowners and state and federal wildlife and land management agencies. SFW can aid in implementing Utah’s CWCS by incorporating the objectives of the strategy into habitat projects funded by the organization. Conservation permit funds awarded to the UDWR will be used to provide the non-federal matching funds required to access federal funding for habitat restoration projects.

*The Audubon Society (Audubon).*—Audubon is dedicated to protecting birds and wildlife through restoring and protecting the environment, securing funding for vital conservation programs, and preserving key natural resource protections. Audubon has initiated the Important Bird Areas (IBA) Program to identify a network of sites that provide critical habitat for birds. This effort recognizes that habitat loss and fragmentation are the most serious threats facing populations of birds across America and around the world. The CWCS will be used to help delineate and designate IBAs for Utah’s avian species of greatest conservation need.

*Mule Deer Foundation (MDF).*—MDF’s goals center on restoring, improving and protecting mule deer habitat (through land and easement acquisitions), which result in self-sustaining, healthy, free-ranging, and huntable mule deer populations. MDF achieves its goals through partnering with state and federal wildlife agencies, conservation groups, businesses and individuals to fund and implement habitat enhancement projects on both public and private lands. MDF can aid in implementing Utah’s CWCS by incorporating the objectives of the strategy into funded habitat restoration projects. Conservation permit funds awarded to the UDWR will be used to provide the non-federal match required to access federal funding for habitat restoration projects.

*The Nature Conservancy (TNC).*—TNC seeks to preserve the plants, animals, and natural communities on Earth by protecting habitat. TNC’s ecoregion planning approach divides the nation into physiographically similar areas to identify and protect large tracts of land that are characterized by unique natural areas and features. This planning methodology is a systematic, science-based approach to habitat conservation. An ecoregional plan is a “blueprint” for conservation that identifies and guides management of the most important conservation sites. Portions of seven distinct TNC ecoregions are included within Utah’s borders. TNC is identifying and developing strategic plans for threatened areas within each ecoregion to protect and maintain biodiversity. Utah’s CWCS can be utilized in developing these plans.

*Rocky Mountain Elk Foundation (RMEF).*—The mission of RMEF is to ensure the future of elk, other wildlife and their habitat through: 1) conserving, restoring and enhancing natural habitats; 2) promoting the sound management of wild, free-ranging elk, which may be hunted or otherwise enjoyed; 3) fostering cooperation among federal, state and private organizations and individuals in wildlife management and habitat conservation; and 4) educating members and the public about habitat conservation, the value of hunting, hunting ethics and wildlife management. RMEF can aid in implementing Utah’s CWCS by incorporating the objectives of the strategy into funded habitat restoration projects. Conservation permit funds awarded to the UDWR will



be used to provide the non-federal matching funds required to access federal funding for habitat restoration projects.

*Utah Cattlemen's Association (UCA).*—UCA commits itself to promoting and protecting the business of raising beef cattle, improving the quality of cattle and beef produced, upholding and defending the rights of all persons in the cattle business, opposing legislation that might injure the cattle business, and establishing state and local exhibits that encourage cattle business.

*Utah Farm Bureau Federation.*—The Farm Bureau has major interests in agriculture related issues, including wildlife. The Farm Bureau supports multiple use and sustained yield principles in managing and maintaining Utah's wildlife and ecosystems, and engages in cooperative agreements with landowners, the UDWR, and other agencies to establish and maintain target numbers of wildlife consistent with land habitat constraints. The DWR will work with private landowners and the Farm Bureau to implement the CWCS on agricultural lands. A newly created Sensitive Species Task Force (collaboratively with UDWR staff) is hosting a workshop in each county.

*Utah Chapter of the American Planning Association (APA).*—The APA provides services for the Utah planning community and helps 400 members statewide participate and share information. The APA supports planners and their work at all levels of governance from federal, state, county and municipal jurisdictions. The national organization has an Environment, Natural Resources and Energy (ENRE) Division whose mission directly informs and enables planners to coordinate within each state to encompass the application of the CWCS.

*Utah Foundation for Quality Resource Management (QRM).*—This organization was founded by private landowners and landowner representatives with a desire to work toward management of healthy watersheds, agricultural values, and healthy wildlife populations. QRM representatives currently provide planning, project design and assistance with implementation for private landowners and public land grazers to achieve the objectives of the mission statement. There are currently three local chapters of QRM (Lost Creek, Chalk Creek, and East Box Elder) and one affiliate (Rich County Coordinated Resource Management). QRM has hosted numerous agency, working group, and local government tours to discuss sustainable shrubsteppe management and has been active in both game and non-game management and research issues.

*Utah Society for Environmental Education (USEE).*—Since 1981, the USEE has been Utah's leader in environmental education (EE). USEE is a non-profit organization providing support services (i.e. website <http://www.usee.org/>, newsletter, trainings, research, conferences etc.) to all EE providers in the state. USEE's mission is to foster environmental knowledge, skills, attitudes, and actions through statewide leadership that serves to expand the quality, scope, and effectiveness of environmental education. USEE acts as a link between EE providers within Utah and to national EE organizations. USEE focuses on work in four different areas: Capacity Building, Demonstrating Quality Environmental Education, Community Innovation, and Organizational Strength. The Annual Action Plan is updated yearly and describes work in each focus area as well as USEE's specific programs and projects.

*Utah Wool Growers Association (UWGA).*—The UWGA is an affiliate of the American Sheep Industry Association (ASI). The organization's purposes include providing consumers with quality lamb and wool products, marketing, obtaining low rates on supplies, protecting livestock from predation and poisoning, and lobbying for state and federal laws that positively impact the wool industry and enhance rangelands.

## Working Groups

Local Working Groups (LWGs) consist of private landowners, local elected officials, federal land permittees and lessees, oil and gas industry, state and federal wildlife and land management agency personnel, and representatives from non-governmental organizations. LWGs meet regularly to discuss and identify conservation and socio-economic issues and needs, establish goals and objectives, and set management priorities. Thus, LWGs are institutionalizing a dynamic community-based process that will work to resolve species conservation issues well into the future.

*Great Basin Bat Cooperative (GBBC).*—The GBBC is currently a pilot program to proactively manage Utah's bats and the efforts of the GBBC are focused in the northern and central portions of the state. Current objectives of the GBBC include: 1) conducting a systematic inventory of the bat species utilizing the northern portion of the Great Basin, 2) identifying areas of high value to bats (i.e. roosts, hibernacula, foraging habitat) and establishing monitoring protocols and conservation measures, and 3) creating and maintaining a central geodatabase for storage and analysis of data. Decision making partners (agencies, organizations, or individuals) are required to provide an annual investment of \$1,000, most choosing to do so with in-kind donations of time or equipment. Of the 18 species of bats currently known to inhabit Utah, six (33%) are listed on the state's sensitive species list. Of the remaining 12, at least half have poorly understood distributions and little to no information has been collected on the status of their populations.

*Reptile Working Group.*—Citizen groups are working closely with UDWR's Native Aquatic Species Program on the conservation and management of Utah's herpetofauna. Individual participants include those who hold membership in the Reptile and Amphibian Negotiation Association (RANA), Utah Herpetological Association (UHA), and other interested, but unaffiliated, members of the public. Participants in the Reptile Working Group volunteer their time to conduct herpetological surveys, providing data that would not otherwise be available to the Program. The CWCS can be used to identify survey needs and develop management strategies for Utah's herpetofauna.

*Sage-grouse Working Groups.*—These groups work to mitigate the effects of habitat and management decisions on Sage-grouse and other shrubsteppe obligate species. Presently 11 LWGs are operational in Utah with two additional groups expected to be operational in 2005. They work collaboratively to develop local management plans that identify strategies and management actions that will be implemented by the LWGs to achieve identified goals and objectives. Utah's CWCS can easily be incorporated into management actions identified by LWGs for Sage-grouse.

*Wolf Working Group (WWG).*—The UDWR created the WWG in the summer of 2003 to respond to the presence of wolves in Utah after federal delisting by developing the Utah Wolf Management Plan that accounts for the biological, socio-political and legal issues surrounding wolves in Utah. The WWG includes representatives from academia (USU faculty), wolf advocates (Utah Wolf Forum), sportsmen representatives (RMEF and SFW), agricultural interests (Utah Farm Bureau Federation and Utah Wool Growers), local government representatives (Utah Association of Counties), the Ute Indian Tribe and the Utah Wildlife Board. Technical advisors from the UDWR, the USFWS, and the US Department of Agriculture

Wildlife Services assist the working group. As the development of both documents has been parallel, the objectives of the CWCS will be incorporated into strategies outlined in the Wolf Management Plan.

## **Joint-Partnership Programs**

*Conservation Reserve Program (CRP) (Farm Security and Rural Investment Act of 2002).*—This program was designed to conserve and protect highly erosive soils on crop lands. The CRP is a voluntary program for agricultural landowners. Through CRP, farmers can receive annual rental payments and cost-share assistance to establish long-term, resource-conserving covers on eligible farmland. The program is administered by the Commodity Credit Corporation through the Farm Service Agency (FSA), and program support is provided by NRCS, Cooperative State Research and Education Extension Service, state forestry agencies, and local Soil and Water Conservation Districts.

*Conservation Security Program (CSP) (Farm Security and Rural Investment Act of 2002).*—CSP is a voluntary program that supports a tradition of ongoing stewardship of working agricultural lands by providing payments for maintaining and enhancing natural resources. Partners include NRCS, Indian Tribes, and private landowners. CSP promotes the conservation and improvement of soil, water, air, energy, plant and animal life, and other conservation purposes. Participants must address wildlife resource concerns to attain the highest payment potential.

*Environmental Quality Incentive Program (EQIP) (Farm Security and Rural Investment Act of 2002).*—The purpose of this Farm Bill program is to enhance and protect habitats for wildlife species experiencing significant population declines. Partners include NRCS, Utah Association of Conservation Districts, Farm Bureau, USFWS and USUEXT. The program seeks to restore habitat on private land that is critical to the survival of at-risk species. The CWCS will be used to identify those habitats.

*Grassland Reserve Program (GRP) (Farm Security and Rural Investment Act of 2002).*—The purpose of this program is to keep vulnerable grasslands from being converted to cropland or other uses. Partners include Farm Service Agency, NRCS, USFS, soil conservation districts and private landowners. The program helps landowners restore and protect grassland, rangeland, pastureland, shrubland and certain other lands and provides assistance for rehabilitating grasslands.

*Landowner Incentive Program (LIP).*—The purpose of LIP is to protect and restore habitat that supports sensitive species on private land. Partners include USFWS, UDWR, TNC and private landowners. The program serves to restore habitat on private land that is critical to the survival of at-risk species. The CWCS will be used to help identify those habitats. A more thorough explanation of the Utah LIP is found in Appendix I.

*Partners For Fish and Wildlife Program.*—The purpose of this program is to conserve, protect, and enhance fish and wildlife and their habitats for the continuing benefit of the American people. Partners include USFWS and private landowners. The program offers technical and financial assistance to private (non-federal) landowners to voluntarily restore wetlands and other fish and wildlife habitats on their land.

*Uintah Basin Interagency Raptor Team (UBIRT).*—This is a joint effort by the BLM, UDWR, USFS, Utah State University – Uintah Basin, USFWS, and HawkWatch International, to coordinate raptor monitoring and habitat improvement. A primary objective of this team is to

develop an interagency database that all members can access for research purposes. CWCS objectives can be used in the development of UBIRT's raptor monitoring and research activities.

*Utah Partners for Conservation and Development (UPCD/Partnership).*—The UPCD is an organization that represents state and federal natural resource agencies, universities, county and local government, private landowners, conservation organizations, and vested stakeholders. The partnership's shared natural resource goals transcend agency jurisdiction and geo-political boundaries. These include Utah's native wildlife and biological diversity, water quality and yield for municipal, agricultural and wildlife uses, sustainable agriculture through working farms and ranches, and outdoor recreation for sustained quality of life and rural economic stability. Strategies identified by the UPCD to improve land health and management are implemented through statewide, regional and local teams that work in concert with management, science and conservation outreach teams. Through watershed restoration and habitat initiatives, the UPCD will directly implement the CWCS while focusing on management, science, and conservation outreach.

*Wetlands Reserve Program (WRP) (Farm Security and Rural Investment Act of 2002).*—WRP is a voluntary program to restore and protect wetlands on private property through conservation easements or restoration cost-share agreements. Partners include NRCS and private landowners. Landowners receive financial incentives to restore or enhance wetlands in exchange for retiring marginal agricultural land.

*Wildlife Habitat Incentive Program (WHIP) (Farm Security and Rural Investment Act of 2002).*-- The purpose of WHIP is to develop and improve wildlife habitat on private lands. Partners include NRCS, soil conservation districts and private landowners. The program provides both technical assistance and cost sharing to help establish and improve fish and wildlife habitat.

## **CHAPTER 4 . PLANNING OVERVIEW**

(Element 7)

### **OVERVIEW**

Prior to the development of Comprehensive Wildlife Conservation Strategies (CWCS), management plans and conservation agreements were developed at Federal, State, and local levels to protect and conserve wildlife and their habitat. While these initiatives have been valuable and productive in achieving their objectives, the CWCS is truly comprehensive in that it recognizes the importance of all of these efforts and provides a framework to address conservation threats and implement actions. The Utah CWCS will serve as a framework to align and relate all wildlife and land management planning approaches already underway, and it may help identify and address existing information gaps.

### **APPROACH**

#### **Coordinating the CWCS with the UDWR Strategic Plan**

Since 1998, the Utah Division of Wildlife Resources (UDWR) has operated under a comprehensive Strategic Plan (UDWR 2000). Objectives of this plan include sustaining and restoring habitat function so that wildlife populations (i.e., range, abundance and distribution) are not hindered by the absence of critical resources (i.e., winter food quantity/quality, shelter requirements or safety/security). Although not required in the elements, this section links the CWCS directly to a corresponding goal and objectives within the UDWR Strategic Plan.

The UDWR Strategic Plan's goal that directly relates to the purpose of Utah's CWCS is to "conserve, protect, enhance, and manage Utah's wildlife species of conservation need." Three objectives were established for this goal (Objectives 2-4 respectively) that are paraphrased here, and serve as the conceptual basis for guiding the direction of the Utah CWCS. These objectives, paraphrased here, are: 1) Increase the population distribution and/or abundance of a specific proportion of classified state species of concern within a specified time frame; 2) Meet state recovery goals for a specific number of currently listed threatened and endangered (i.e., Tier I) species within a specified time frame while at the same time preventing the need for further federal listing of any additional species from Tiers II or III; and 3) Maintain distribution and abundance of all other naturally occurring wildlife species and health of priority ecosystems within a specified time frame.

UDWR has other Strategic Plan goals beyond the one that most readily aligns with the purpose of the CWCS. These, however, are not specific to the charge given the States to address in their Strategy. Thus, since the National Acceptance Advisory Team (NAAT) has approved and accepted Utah's CWCS, the complete UDWR Strategic Plan will serve as a supplemental planning document. However, the two will be linked through this commonly shared goal and its objectives. Within a year of approval of the CWCS, the UDWR Strategic Plan will be reviewed and reissued. Then, when the CWCS is revised in ten years, the UDWR Strategic Plan will again be renewed.

## Linking other Plans with the CWCS

The plans listed below are those specifically identified by UDWR and its CWCS Partner Advisory Group as being relevant to Utah's CWCS. Independently, each partner has established plans to preserve individual species, species groups, or important habitat types or areas. This section's purpose is to provide an inventory of the efforts that are already underway which will help avoid duplicating efforts and identify species of concern not currently covered by any plans. In order to take advantage of the work and planning that has gone into these various efforts, partners will be strongly encouraged to coordinate their wildlife and habitat related plans with the CWCS whenever possible. This will frequently occur at the level where the five regional implementation teams (through the Utah Partners for Conservation and Development's Watershed Initiative) coordinate with all other local land, water and wildlife management planning efforts conducted by private and public entities engaged in community-based conservation. Where available, Internet links to these planning efforts are provided.

### FOREST MANAGEMENT PLANS (USFS)

Forest Management Plans provide management direction for the multiple uses of national forests including outdoor recreation, range, timber, watershed, fish and wildlife, minerals, wilderness, roadless areas, and cultural resources. The plan reflects current issues, values, and management practices.

#### Ashley National Forest

The Ashley National Forest covers 1,287,909 acres in northeast Utah and includes 276,175 acres of High Uintas Wilderness.

#### Dixie National Forest

[http://www.fs.fed.us/r4/dixie/projects/FParea/LiveDocs/Dixie\\_LRMP.pdf](http://www.fs.fed.us/r4/dixie/projects/FParea/LiveDocs/Dixie_LRMP.pdf)

Dixie National Forest consists of two million acres that stretch across southern Utah. The largest National Forest in Utah, it straddles the divide between the Great Basin and the Colorado River.

#### Fishlake National Forest

<http://www.fs.fed.us/r4/dixie/projects/FParea/LiveDocs/Fishlake.pdf>

Fishlake National Forest consists of 1.4 million acres of plateau and mountain land in central Utah. Vegetation is diverse and includes aspen, spruce-fir, mountain brush, pinyon pine-juniper woodlands, and sagebrush-grasslands.

#### Manti-LaSal National Forest

[http://www.fs.fed.us/r4/mantilasal/projects/projects%20forest%20plan/Forest\\_Plan\\_1986/planindex.htm](http://www.fs.fed.us/r4/mantilasal/projects/projects%20forest%20plan/Forest_Plan_1986/planindex.htm)

The 1,413,111-acre Manti-La Sal National Forest is located in southeastern Utah. The Manti Division is part of the remnant Wasatch Plateau (5,000 to 10,000 foot elevation) exhibiting high elevation lakes, diverse vegetation, near vertical escarpments, and areas of scenic and geologic interest.

#### Uinta National Forest

[http://www.fs.fed.us/r4/uinta/projects/planning/docs/2003/fp/acrobat/fp\\_intro.pdf](http://www.fs.fed.us/r4/uinta/projects/planning/docs/2003/fp/acrobat/fp_intro.pdf)

The Uinta National Forest, in central Utah, is characterized by mountain brush, pinyon-juniper, conifers, and aspen.

### Wasatch-Cache National Forest

[http://www.fs.fed.us/r4/wcnf/projects/feis/revised\\_forest\\_plan.pdf](http://www.fs.fed.us/r4/wcnf/projects/feis/revised_forest_plan.pdf)

Wasatch-Cache National Forest lands are located in the northern and western slopes of the Uinta Mountains, the Wasatch Front, and the Stansbury Range, in the Great Basin. The forest encompasses approximately 2 million acres that protect high quality watersheds for the state of Utah.

### LAND USE PLANS (BLM)

Land Use Plans (LUP) establish guidance, objectives, policies, and management actions for public lands administered by BLM field offices. These plans are comprehensive in nature, and resolve or address a wide variety of issues such as soil and water resources, vegetation, and wildlife habitat and fisheries management. The following list includes information about Utah's BLM field offices and links to LUPs.

Cedar City, 1986

<http://www.ut.blm.gov/planning/CBGA+ROD.PDF>

Revisions of Pinion and Cedar/Beaver/Garfield/Antimony LUPs are forecasted to begin in Fall 2007 and be completed by Spring 2011.

Fillmore, 1987

<http://www.ut.blm.gov/planning/WARMRODANDRPS.PDF>

Further land use planning in the Fillmore Field Office is currently prohibited due to a planning moratorium imposed by Congress in the National Defense Authorization Act for Fiscal Year 2000.

Grand Staircase Escalante National Monument, 1999

<http://www.ut.blm.gov/planning/GSENMAMPANDROD/plan.pdf>

The National Monument's LUP revision began in Fall 2003 and will be completed by Spring 2006.

Moab, incomplete

The Moab Field Office is responsible for administering approximately 1.85 million acres of public lands located in southeastern Utah contained within Grand County and the northern portion of San Juan County. The Moab LUP was initiated in Summer 2003 and will be completed by June 2006.

Monticello, incomplete

The Monticello Field Office is responsible for administering about 1.78 million acres of public lands in southeastern Utah contained within the southern portion of San Juan County. An LUP was initiated in Summer 2003 and will be completed in June 2006.

Price, incomplete

The Price Field Office manages 2.5 million acres of land in central Utah. The Price River Resource Area and the San Rafael Resource Area will be jointly managed under Price's new LUP. The LUP was initiated in Fall 2001 and will be complete by Fall 2005.

**Richfield, incomplete**

In 2001, the Richfield Field Office began development of an LUP for 2.2 million acres of public land in Sanpete, Sevier, Piute, Wayne and eastern Garfield Counties in Utah, and the mineral estate under all BLM land and the adjoining National Forests. This plan will be completed in Fall 2006.

**Salt Lake, 1986, 1990**

<http://www.ut.blm.gov/planning/BOXRODANDRPS.PDF>

<http://www.ut.blm.gov/planning/PONYRODANDRPS.PDF>

Further land use planning in the majority of the Salt Lake Field Office is currently prohibited due to a planning moratorium imposed by Congress in the National Defense Authorization Act for Fiscal Year 2000.

**St. George, 1999**

<http://www.ut.blm.gov/planning/STGEORGE/DIXIEEIS.PDF>

The St. George Field Office manages 629,000 acres of public land in southwestern Utah. The 1999 LUP is actively used and will be revised in 2009.

**Kanab, incomplete**

The Kanab Field Office manages approximately 600,000 acres of public land in south central UT. The planning area also includes an additional 40,500 acres of public land that falls within the old Escalante Planning Unit. These public lands, although managed by the Grand Staircase-Escalante National Monument (GSENM), will be included in the development of the Kanab LUP, which was initiated in Fall 2004. Expected completion is Spring 2008.

**Vernal, incomplete**

In 2001, the Vernal Field Office initiated the process to develop a land LUP for approximately 1,789,000 acres of surface estate lands and 1,934,000 acres of mineral estate lands in north-eastern Utah. This plan will be completed in Fall 2005.

## COMPREHENSIVE CONSERVATION PLANS – UNITED STATES FISH AND WILDLIFE SERVICE

The 1997 National Wildlife Refuge Improvement Act requires that the U.S. Fish and Wildlife Service develop a "Comprehensive Conservation Plan" (CCP) for each of the nation's more than 530 Refuges within 15 years. Every Refuge plan should address wilderness, land acquisition, compatibility, and priorities.

**Bear River Migratory Bird Refuge, 1997**

[http://library.fws.gov/CCPs/bear\\_river\\_final.pdf](http://library.fws.gov/CCPs/bear_river_final.pdf)

This plan outlines management goals, performance standards, and budgets for the refuge for the next 15 years. Objectives include management of water, hunting, grasslands, predators, fire, integrated pests, and fisheries.

**Fish Springs National Wildlife Refuge, 2004**

[http://library.fws.gov/CCPs/fishsprings\\_final04.pdf](http://library.fws.gov/CCPs/fishsprings_final04.pdf)

The CCP will guide management of Refuge operations, habitat restoration and visitor services for the next 15 years by providing clear goals and objectives, implementation strategies, and recommended staffing and funding for the Refuge. Habitat, ecological integrity, cultural resources, visitor services, and partnerships are primary goals set forth in the CCP.



**Ouray National Wildlife Refuge, 2000**

[http://library.fws.gov/CCPs/ouray\\_final.pdf](http://library.fws.gov/CCPs/ouray_final.pdf)

This plan outlines management objectives to improve the performance of Ouray as a national Wildlife Refuge over 15 years. Four issues of particular concern include degradation and loss of riparian habitat, invasion of nonnative plants, selenium control, and mosquito production. The plan specifically identifies some riparian sites that presently lend themselves to restoration.

**SPECIES RECOVERY PLANS – UNITED STATES FISH AND WILDLIFE SERVICE****Bald Eagle (Northern States), 1982**

<http://www.sdgfp.info/Wildlife/WildlifePlans/BERecPlan.pdf>

This recovery plan defines specific research and management objectives designed to ensure the continued survival of the small and possibly declining population of southwestern bald eagles. With a focus on restoration and protection of southwestern riparian habitat, recovery plans include population recovery, species management, and research.

**Black-footed Ferret, 1978**

[http://ecos.fws.gov/docs/recovery\\_plans/1988/880808.pdf](http://ecos.fws.gov/docs/recovery_plans/1988/880808.pdf)

The Black-footed Ferret Recovery Plan outlines steps for recovery of the black-footed ferret throughout its historical range. The goals of the plan are to increase the number of captive ferrets to a facility capacity of 200 breeders by 1991, and establish populations, which before breeding, number 1,500 black-footed ferrets in 10 or more populations in the wild.

**Bonytail Chub, 1990**

[http://ecos.fws.gov/docs/recovery\\_plans/2002/020828a.pdf](http://ecos.fws.gov/docs/recovery_plans/2002/020828a.pdf)

The new common name for this species is bonytail. This species is native to the Green and Colorado River drainages in Utah. Utah monitors this species in the wild, but wild bonytail have not been located in many years. These fish are also reared at the Wahweap State Fish Hatchery and are released into the Green River. The Division is experimenting with rearing bonytail in off-channel habitats along the Green River. Recovery Goals for this species were finalized in 2002. The Division participates in the Upper Colorado River Endangered Fish Recovery Implementation Program and the Upper Colorado River Endangered Fish Recovery Team to help coordinate recovery efforts for this species.

## California Condor, 1996

[http://ecos.fws.gov/docs/recovery\\_plans/1996/960425.pdf](http://ecos.fws.gov/docs/recovery_plans/1996/960425.pdf)

The California condor (*Gymnogyps californianus*) is federally listed as an endangered species. In Utah south of Interstate 70, except in National Parks, the condor is considered an experimental/non-essential population; north of I-70 and in National Parks, the condor is considered Endangered. The current population consists of a captive population and captive-bred populations reintroduced into the wild in California and northern Arizona near the Utah border. The minimum criterion for reclassification to Threatened is the maintenance of at least two non-captive populations and one captive population. These populations (1) must each number at least 150 individuals, (2) must each contain at least 15 breeding pairs and (3) be reproductively self-sustaining and have a positive rate of population growth. UDWR participates in recovery efforts through coordination with USFWS and the Arizona Game and Fish Department primarily through monitoring condor movements, assisting in capturing “problem” condors and planning for the possibility of condor nesting in Utah.

## Colorado Squawfish, 1991

[http://ecos.fws.gov/docs/recovery\\_plans/2002/020828b.pdf](http://ecos.fws.gov/docs/recovery_plans/2002/020828b.pdf)

The new common name for this species is Colorado pikeminnow. A native to the Green, Colorado, and San Juan River drainages in Utah, this fish can still be found in the wild, where it is monitored by the UDWR. They are also reared in captivity at the Dexter National Fish Hatchery, New Mexico. Recovery Goals for this species were finalized in 2002. UDWR participates in the Upper Colorado River Endangered Fish Recovery Implementation Program and the Upper Colorado River Endangered Fish Recovery Team to help coordinate recovery efforts for this species.

## Desert Tortoise, 1994

Desert tortoises occur in Utah only in the far southwestern corner of the state in the Mojave Desert. Protection of the species and its habitat was addressed in the Washington County Habitat Conservation Plan 1995. UDWR conducts extensive monitoring for this species in Utah, provides desert tortoise removal services for incidental take permitted under the HCP, and administers a desert tortoise adoption program for animals abandoned along the Wasatch Front. UDWR is an active participant in the Washington County Habitat Conservation Plan and associated management plans that administer the Red Cliffs Desert Reserve and other protected areas of the Mojave Desert in Washington County.

## Gray Wolf, 1987

[http://ecos.fws.gov/docs/recovery\\_plans/1987/870803.pdf](http://ecos.fws.gov/docs/recovery_plans/1987/870803.pdf)

This plan outlines management guidelines and objectives for the gray wolf in the northern Rocky Mountain region. The primary goal of this plan is federal delisting by securing and maintaining a minimum of 10 breeding pairs of wolves in three recovery areas for at least three years.

**Humpback Chub, 1990**

[http://ecos.fws.gov/docs/recovery\\_plans/2002/020828c.pdf](http://ecos.fws.gov/docs/recovery_plans/2002/020828c.pdf)

This species is native to the Green and Colorado River drainages in Utah. Of the four big river fish (bonytail, humpback chub, Colorado pikeminnow, and razorback sucker) humpback chub populations are probably the largest, though still dramatically reduced from historic levels, according to the most recent population estimates by UDWR. Recovery Goals for this species were finalized in 2002. The Division participates in the Upper Colorado River Endangered Fish Recovery Implementation Program and the Upper Colorado River Endangered Fish Recovery Team to help coordinate recovery efforts for this species.

**June Sucker, 1999**

[http://ecos.fws.gov/docs/recovery\\_plans/1999/990625.pdf](http://ecos.fws.gov/docs/recovery_plans/1999/990625.pdf)

Endemic to Utah Lake, very few wild June sucker can be found. UDWR has been actively monitoring this species since the 1980s. Also in the 1980s, UDWR initiated a program of taking wild-caught eggs and rearing June sucker in hatcheries and refugia. Refuge-reared fish are now returning to spawn along side wild fish. UDWR participates in the June Sucker Recovery Implementation Program and the June Sucker Recovery Team to help coordinate recovery efforts for these fish.

**Kanab Ambersnail, 1995**

[http://ecos.fws.gov/docs/recovery\\_plans/1995/951012.pdf](http://ecos.fws.gov/docs/recovery_plans/1995/951012.pdf)

This terrestrial snail requires wet habitats. It is found in southern Utah as well as in northern Arizona, according to current taxonomy, which is being investigated further. An Interim Conservation Plan for this species was produced by the Arizona Game and Fish Department in 2002, and includes actions for Utah populations. The highest priority for UDWR at this time is to resolve the species' taxonomy. UDWR participates in the Kanab Ambersnail Working Group to help coordinate recovery efforts for this species.

**Mexican Spotted Owl, 1995**

[http://ifw2es.fws.gov/Documents/R2ES/MSO\\_Recovery\\_Plan.pdf](http://ifw2es.fws.gov/Documents/R2ES/MSO_Recovery_Plan.pdf)

The Recovery Plan provides a basis for management actions to be undertaken by land-management agencies and Indian Tribes to remove recognized threats and recover the Mexican Spotted Owl. The plan's five elements include a recovery goal and set of delisting criteria, provision of three management strategies for habitat protection, recommendation for population and habitat monitoring, a research program to determine anthropogenic effects on the species and its habitat, and oversight and coordination responsibilities.

**Razorback Sucker, 1998**

[http://ecos.fws.gov/docs/recovery\\_plans/2002/020828d.pdf](http://ecos.fws.gov/docs/recovery_plans/2002/020828d.pdf)

This species is much reduced from historic levels, though a natural spawning site has been identified in the Green River in Utah. Razorback suckers can be found in the Green, Colorado, and San Juan River drainages. UDWR monitors razorback suckers in the wild, holds a stock at the Wahweap State Fish Hatchery, and has been experimenting with rearing this species in off-channel ponds along the Green River. Recovery goals for razorback sucker were finalized in 2002. UDWR participates in the Upper Colorado River Endangered Fish Recovery Implementation Program and the Upper Colorado River Endangered Fish Recovery Team to help coordinate recovery efforts for this species.

## Southwestern Willow Flycatcher, 2002

<http://arizonaes.fws.gov/SWWFFINALRecPlan.htm>

This document contains information regarding the current population status and habitat requirements of this species, and threats to its continued survival, including significant loss of breeding habitat. Proposed actions for species recovery to the point of reclassification as “threatened” or delisting include: 1) Increase and improve occupied, suitable, and potential breeding habitat; 2) Increase metapopulation stability; 3) Improve demographic parameters; 4) Minimize threats to wintering and migration habitat; 5) Survey and monitor; 6) Conduct research; 7) Provide public education and outreach; 8) Assure implementation of laws, policies, and agreements that benefit the flycatcher; and 9) Track recovery progress.

## Utah Prairie Dog, 1991

[http://ecos.fws.gov/docs/recovery\\_plans/1991/910930b.pdf](http://ecos.fws.gov/docs/recovery_plans/1991/910930b.pdf)

This plan provides guidelines for management and recovery of the Utah Prairie Dog in Utah. The recovery objective is federal delisting through the establishment of a self-sustaining viable unit with retention of genetic diversity. Management actions for meeting this objective are outlined.

## Virgin River Fishes, 1995

[http://ecos.fws.gov/docs/recovery\\_plans/1995/950419a.pdf](http://ecos.fws.gov/docs/recovery_plans/1995/950419a.pdf)

Two species are addressed in this plan, the woundfin and the Virgin River chub. Virgin River chub numbers are low in the Virgin River drainages; woundfin numbers are extremely low. Woundfin have been transferred to the Dexter National Fish Hatchery, New Mexico, and a very few transferred woundfin persist at the Wahweap State Fish Hatchery. The UDWR participates in the Virgin River Resource Management and Recovery Program and Virgin River Fishes Recovery Team to help coordinate recovery efforts for these fish.

HABITAT CONSERVATION PLANS – UNITED STATES FISH AND WILDLIFE SERVICE

<http://endangered.fws.gov/hcp/>

Habitat Conservation Plans (HCPs) are developed by a non-federal entity (e.g., a landowner or local government) in order to apply for an incidental take permit under section 10(a)(1)(B) of the Endangered Species Act. An incidental take permit allows a property owner to conduct otherwise lawful activities in the presence of listed species, thus allowing development to proceed while promoting conservation of threatened and endangered species. The HCP describes, among other things, the anticipated effect of a proposed take on the affected species and how that take will be minimized and mitigated. There are five active HCPs in the state.

Connel Gower, Iron Co. (Utah Prairie Dog)

Noriega, Zittering, Finch, Panguitch (Utah Prairie Dog)

Hell’s Canyon, Salt Lake Co. (Peregrine Falcon - delisted)

Iron Co. (Utah Prairie Dog, Bald Eagle)

Washington Co. (Bald Eagle, Southwestern Willow Flycatcher, Mexican Spotted Owl, Desert Tortoise, Woundfin)

## NATIONAL PLANS

### Continental Partners in Flight (USFWS)

<http://www.partnersinflight.org/cplan.htm>

This plan provides a continental synthesis of priorities and objectives to guide landbird conservation actions at national and international scales, and serves as the blueprint of habitat conservation. The plan stresses stewardship of habitats and species, research, and monitoring.

### Important Bird Areas (Audubon)

<http://www.audubon.org/bird/iba/index.html>

Important Bird Areas (IBAs) are sites that provide essential habitat for one or more bird species, and include sites for breeding, wintering, and/or migrating species. To qualify as an IBA, the site must support species of conservation concern (e.g., threatened and endangered species), restricted-range species (species vulnerable because they are not widely distributed), species that are vulnerable because their populations are concentrated in one general habitat type or biome, or species, or groups of similar species (such as waterfowl or shorebirds), that are vulnerable because they occur at high densities due to flocking behavior.

### National Wetlands Priority Conservation Plan (USDI)

The objective of this plan is to assist agencies in focusing their acquisition efforts on important, scarce and vulnerable wetlands in the Nation, and to establish priorities for wetlands protection that do not involve acquisition. The NWPCP applies only to wetlands that would be acquired by Federal agencies and States using Land and Water Conservation Fund (LWCF) appropriations.

### North American Waterbird Conservation Plan (USFWS)

<http://www.nacwcp.org/pubs/complete.pdf>

This plan is the product of an independent partnership of individuals and institutions having interest and responsibility for conservation of waterbirds and their habitats and provides a framework for the conservation and management of 210 species utilizing aquatic habitats. The plan documents a process for species status assessment, identifies many key issues requiring conservation action, and proposes the development of a continental monitoring partnership including standardized methodology, bias-assessment, and internet-accessible database systems to support status and trend evaluation.

### North American Waterfowl Management Plan (USFWS)

<http://birdhabitat.fws.gov/nawmp/images/NAWMP2004.pdf>

The North American Waterfowl Management Plan is an international action plan for a partnership of government, non-government and private organizations to conserve migratory birds throughout the continent by conserving landscapes, guided by sound science. Plan projects contribute to the protection of habitat and wildlife species and its goal is to restore waterfowl populations to their 1970s levels by conserving habitat.

### United States Shorebird Conservation Plan (USFWS)

<http://shorebirdplan.fws.gov/USShorebird/downloads/USShorebirdPlan2Ed.pdf>

This plan was developed by state and federal agencies and non-governmental organizations to conserve migratory shorebirds and their habitats. The plan provides a scientific framework to determine species, sites, and habitats that most urgently need conservation action. Goals of the plan are to ensure that shorebird habitat, adequate in quantity and quality, is maintained at the local level, and to maintain or restore shorebird populations at the continental and hemispheric levels.

### REGIONAL PLANS

#### Bird Conservation Regions (BCRs)

<http://www.nabci-us.org/bcrs.html>

Initiated by the North American Bird Conservation Initiative (NABCI), BCRs are ecologically distinct regions in North America with similar avian communities, habitats, and resource management issues. BCRs were established to assist in range-wide bird conservation by dividing the US into distinct conservation units. Their purposes include facilitating communication among bird conservation initiatives, facilitating regional bird conservation, promoting partnerships, and identifying and resolving conflicting conservation priorities.

- Colorado Plateau Bird Conservation Region (BCR 16) includes the Wasatch and Uinta Mountains to the west and the Southern Rocky Mountains to the east, separated by the Colorado Plateau.
- Great Basin Bird Conservation Region (BCR 9) includes the Northern Basin and Range, Columbia Plateau, and the eastern slope of the Cascade Range.
- Northern Rockies Bird Conservation Region (BCR 10) includes the Northern Rocky Mountains and outlying ranges in both the United States and Canada, and also the intermontane Wyoming Basin and Fraser Basin.

#### Heart of the West Conservation Plan, Wild Utah Project

This plan is intended to guide land managers and land users in the Rocky Mountains to modify human activities to meet the needs of the land. The plan identifies areas where habitat is critical for the health of species and communities and areas where responsible development can occur with a low risk to ecosystem health.

#### Intermountain West Joint Venture (IWJV) All Bird Plan (incomplete)

IWJV promotes the restoration and maintenance of all bird populations; fosters the protection, restoration, and enhancement of wetlands, riparian habitats, and the widely diverse uplands characteristic of the region. The IWJV Strategic Plan will focus on implementing strategies outlined in national plans for waterbirds (North American Waterbird Conservation Plan), shorebirds (US Shorebird Plan), waterfowl (North American Waterfowl Plan), and landbirds (Partners in Flight) assisted by the Coordinated Implementation Plan for Bird Conservation in Utah and 10 additional states throughout the intermountain west.



### Intermountain West Regional Shorebird Plan

<http://shorebirdplan.fws.gov/RegionalShorebird/downloads/IMWEST4.doc>

The intermountain west (IMW) is North America's most important region for several shorebird species for breeding and other life history stages. The most important issue facing shorebird conservation in the IMW is the competition for water. The IMW plan addresses this and other issues through five goals, including habitat management, population monitoring and assessment, research, outreach, and planning for regional cooperation in conservation.

### North American Waterfowl Management Plan - Great Salt Lake Project

This plan involves \$1 million in federal funds with a commitment to match with \$2 million through partnership (i.e., NAWCA) funded conservation activities for waterfowl on the Great Salt Lake. This plan is with Intermountain West Joint Venture's Great Salt Lake Focus Area Plan.

### North American Waterfowl Management Plan - Utah Lake Project

This plan involves \$1 million in federal funds with a commitment to match with \$2 million through partnership (i.e., NAWCA) funded, conservation activities for waterfowl on Utah Lake. This plan is consistent with Intermountain West Joint Venture's Utah Lake Focus Area Plan.

### The Nature Conservancy (TNC) Ecoregional Planning

TNC's ecoregional planning approach divides the nation into physiographically similar areas to identify and protect large tracts of land that are characterized by unique natural areas and features. TNC is identifying and developing strategic plans for threatened areas within each ecoregion to protect and maintain biodiversity.

- Utah High Plateaus Ecoregion (TNC Ecoregion 18) includes southern Utah Mountains
- Colorado Plateau Ecoregion (TNC Ecoregion 19) includes southeastern corner of Utah
- Great Basin Ecoregion (TNC Ecoregion 11) includes western have of Utah
- Mojave Desert Ecoregion (TNC Ecoregion 17) includes southwestern corner of Utah
- Wyoming Basin Ecoregion (TNC Ecoregion 10) includes northeastern corner of Utah
- Utah-Wyoming Rocky Mountains Ecoregion (TNC Ecoregion 9) includes mountains in northern Utah
- Columbia Plateau Ecoregion (TNC Ecoregion 6) includes extreme northwest corner of Utah

### Western Regional Waterbird Plan (incomplete)

This Plan addresses populations and habitats in Bird Conservation Regions (BCRs) 9, 10, 15 and 16 (U.S. NABCI Committee 2000). The purpose of the Plan is to fill knowledge gaps and aid in "all-bird" conservation efforts of the Intermountain West Joint Venture, 11 States, and other entities associated with the geographic scope of the Plan. Success of the activities outlined in the Plan will be measured by both important habitat and focal species monitoring, and identification of monitoring and research needed to develop trend and population data for species for which there are little or no data.

## STATE PLANS

### Coordinated Implementation Plan for Bird Conservation in Utah (IWJV)

This habitat conservation strategy promotes the restoration and maintenance of bird populations in Utah, and fosters the protection, restoration, and enhancement of priority habitats in the state and identifies focal areas of avian management importance. Utah's Implementation Bird Plan is based on national plans but plan objectives are specific to Utah's priority birds and their habitats.

### Utah Avian Conservation Strategy (Utah Partners in Flight)

[http://www.wildlife.utah.gov/publications/pdf/utah\\_partners\\_in\\_flight.pdf](http://www.wildlife.utah.gov/publications/pdf/utah_partners_in_flight.pdf)

The plan is a comprehensive strategy for conservation and management of neotropical migrants in Utah. The plan prioritizes avian species and their habitats to set objectives for those species that are most in need of immediate and continuing conservation, as well as recommends appropriate conservation actions required to accomplish stated objectives. This document provides general information for hundreds of Utah's breeding birds and detailed information for over 20 species prioritized for conservation efforts and their habitats. It also provides detailed descriptions and maps of Utah's bird habitats. This publication was sponsored by Partners in Flight.

### Utah Shorebird and Waterbird (incomplete)

This plan will focus on the Great Salt Lake and Utah Lake areas but will include several important, outlying wetland areas. Plan development has been initiated; the plan will parallel the National and Great Basin Waterbird and Shorebird plans and will include input from local stakeholders.

### Utah Important Bird Areas (Audubon)

<http://www.audubon.org/bird/iba/utah/>

IBA sites in Utah are designated based similar criteria as national sites. There are fifteen IBA sites in Utah including the five major bays on Great Salt Lake - Farmington, Ogden, Bear River, Gilbert (or South Arm), and Gunnison (or North Arm); Provo and Goshen Bay on Utah Lake; Cutler Marsh-Amalga Barrens in Cache County; the Upper Strawberry Watershed in Wasatch County; and, Lytle Preserve in Washington County, as well as Fish Springs National Wildlife Refuge, Ouray National Wildlife Refuge, Desert Land and Livestock Ranch, Fremont River within Capitol Reef National Park, and Clear Lake Waterfowl Management Area.

### Utah Wildlife Habitat Incentives Program (WHIP) Plan (NRCS)

State WHIP plans ensure that resources are targeted to the needs of the highest priority wildlife habitat. The plan will include information on State wildlife priorities, which may be expressed as habitat types of special concern and/or wildlife species to be targeted.

## SPECIES-SPECIFIC MANAGEMENT PLANS

### Band-tailed Pigeon (USFWS – Interior, Pacific Flyway)

[http://pacificflyway.gov/Documents/Ibp\\_plan.pdf](http://pacificflyway.gov/Documents/Ibp_plan.pdf)

The goal of this plan is to maintain the Four Corners Band-tailed Pigeon population at a level consistent with optimum distribution, density, and recreational uses. Plan objectives include maximizing potential for sustained consumptive and nonconsumptive uses and increasing habitat quality and quantity.



**Bighorn Sheep (UDWR – statewide)**

[http://www.wildlife.utah.gov/hunting/biggame/pdf/bighorn\\_plan.pdf](http://www.wildlife.utah.gov/hunting/biggame/pdf/bighorn_plan.pdf)

This document provides a basis for management actions to be undertaken to restore bighorn sheep to their native habitat throughout Utah. Plan objectives are to establish optimum populations of bighorn sheep in all suitable habitat within the state, provide good quality habitat for healthy populations of bighorn sheep, and provide high quality opportunities for hunting and viewing of bighorn sheep.

**Black Bear (UDWR – statewide)**

<http://www.wildlife.utah.gov/bear/pdf/00bearplan.pdf>

The purpose of this document is to provide an assessment of black bear management and provide direction for black bear management in Utah. Plan objectives include maintaining or increasing current bear distribution and populations, minimizing loss in quality and quantity of critical and high priority bear habitat, and reducing the risk of human death or injury by bears.

**Cougar (UDWR – statewide)**

<http://www.wildlife.utah.gov/pdf/cmgtplan.pdf>

This document provides overall guidance and direction for Utah's management program for cougar. This plan describes general information on cougar natural history, management, habitat, and population status, and discusses issues concerning cougar management in Utah. The goal of this plan is to maintain a healthy cougar population within existing occupied habitat while considering human safety, economic concerns, and other wildlife species.

**Fat-whorled Pond Snail (UDWR – statewide, incomplete)**

The Division is developing a management plan for the fat-whorled pond snail, endemic to a few spring pools in Box Elder County along the northern shore of the Great Salt Lake.

The management plan coordinates the efforts of other agencies and private parties.

**Gray Wolf (UDWR – statewide incomplete)**

The purpose of this document is to guide management of wolves in Utah during an interim period until 2015, or until wolves have established territories in Utah or assumptions of the plan (political, social, biological, or legal) change. During this interim period, arriving wolves will be studied to determine where they are most likely to settle without conflict. The goal of the plan is to manage, study, and conserve wolves moving into Utah, while avoiding conflicts with the wildlife management objectives of the Ute Indian Tribe, preventing livestock depredation, and protecting the investment made in wildlife in Utah. The plan describes the general ecology of the gray wolf and outlines the strategies that will be employed to accomplish the purposes of the plan. This plan will not go into effect until the gray wolf is removed from the Endangered Species list and management authority is transferred to the State of Utah.

**Leatherside Chub (UDWR – statewide, incomplete)**

UDWR is developing a state management plan for the southern population of the leatherside chub. An associated plan for managing the northern population together with counterparts in Idaho and Wyoming is being developed using the same format. The status of all populations is currently being determined, but appears reduced from historic levels.

## Moose (UDWR – statewide)

[http://www.wildlife.utah.gov/hunting/biggame/pdf/moose\\_plan.pdf](http://www.wildlife.utah.gov/hunting/biggame/pdf/moose_plan.pdf)

The plan provides overall guidance and direction to Utah's moose management program. The plan assesses current information on moose, identifies issues and concerns relating to moose management in Utah, and establishes goals, objectives and strategies for future moose management programs.

## Mountain Goat (UDWR – statewide)

[http://www.wildlife.utah.gov/hunting/biggame/pdf/rocky\\_mtn\\_goat\\_plan.pdf](http://www.wildlife.utah.gov/hunting/biggame/pdf/rocky_mtn_goat_plan.pdf)

This document provides a basis for mountain goat management throughout Utah with an emphasis on landscape level and ecosystem considerations. The plan introduces the natural history, management, and habitat of the species and addresses the controversy of goat transplant.

## Mule Deer (UDWR – statewide)

[http://www.wildlife.utah.gov/hunting/biggame/pdf/mule\\_deer\\_plan.pdf](http://www.wildlife.utah.gov/hunting/biggame/pdf/mule_deer_plan.pdf)

This document provides overall guidance and direction for Utah's management program for mule deer for five years. The plan describes general information on mule deer natural history, management, habitat, and population status, and discusses issues concerning mule deer management in Utah. Goals, objectives and strategies for managing mule deer populations are identified.

## River Otter Management Plan (UDWR – statewide)

[http://www.wildlife.utah.gov/pdf/otter\\_plan.pdf](http://www.wildlife.utah.gov/pdf/otter_plan.pdf)

The purpose of this plan is to provide direction for management of northern river otter in Utah and to expand the current distribution to its historic range. The plan describes the general ecology of the northern river otter, reviews research conducted on otters in Utah, and outlines the strategies that will be employed to accomplish the purposes of the plan.

## Rocky Mountain Elk (UDWR – statewide)

[http://www.wildlife.utah.gov/public\\_meetings/march\\_rac/1.pdf](http://www.wildlife.utah.gov/public_meetings/march_rac/1.pdf)

This document will provide overall guidance and direction for Utah's elk management program for five years from the date of approval by the Utah Wildlife Board. This plan briefly describes general information on elk natural history, management, habitat, and population status. It also discusses issues concerning elk management in Utah identified by the elk committee. Goals, objectives and strategies for managing elk populations are identified. The plan will be used to help set priorities for elk management programs and will provide overall guidance for individual unit management plans.

## Sage-grouse (UDWR – statewide)

<http://www.wildlife.utah.gov/uplandgame/pdf/2002manplan.pdf>

This plan seeks to protect, enhance, and conserve sage-grouse populations and sagebrush-steppe ecosystems through establishment of populations of Sage-grouse in areas where they were historically found. The plan addresses current issues regarding management of this species.

**Sharp-tailed Grouse (UDWR – statewide)**

<http://www.wildlife.utah.gov/uplandgame/pdf/02sharptail.pdf>

This document outlines a management strategy to maintain Sharp-tailed Grouse populations in Utah through protection and restoration of remaining habitat and expansion of populations into secure habitat within the species' former range. The goal of this conservation plan is to maintain and increase Columbian Sharp-tailed Grouse population levels within each management area, and reintroduce or establish populations within suitable habitats.

**Trumpeter Swan (USFWS – Rocky Mountain, Pacific Flyway)**

[http://www.pacificflyway.gov/Documents/Tsip\\_plan.pdf](http://www.pacificflyway.gov/Documents/Tsip_plan.pdf)

This plan seeks to restore the RMP as a secure and primarily migratory population with average annual growth. Management actions include redistribution of wintering swans to other wintering grounds, encouraging population growth in U.S. and Canadian flocks, increasing food resources in critical habitat, and implementing research and public education programs.

**Tundra Swan (USFWS – Western, Pacific Flyway)**

[http://www.pacificflyway.gov/Documents/Wts\\_plan.pdf](http://www.pacificflyway.gov/Documents/Wts_plan.pdf)

The goal of this plan is to ensure the maintenance of the western population of Tundra Swans at its current size and distribution. Objectives include providing suitable habitat, encourage maintenance of current population size and distribution, and provide for sustainable public uses, including education.

**“MANAGEMENT UNIT” MANAGEMENT PLANS (MULE DEER)**

Management Units are subdivisions of geographical regions. Each unit employs a management strategy for big game species that is specific to the particular geographic features of the unit. The thirty management units in Utah are listed by region below (with a telephone contact number) and all units have completed an active management plan for mule deer.

Central Region – Phone: 801-491-5678

1. Wasatch Mountains
2. Oquirrh-Stansbury
3. West Desert

Northeastern Region – Phone: 435-781-9453

4. North Slope
5. South Slope
6. Book Cliffs

Northern Region – Phone: 801-476-2740

7. Box Elder
8. Cache
9. Ogden
10. Morgan/Rich
11. East Canyon
12. Chalk Creek
13. Kamas

## Southeastern Region – Phone: 435-636-0260

14. Nine Mile
15. San Rafael
16. La Sal
17. San Juan
18. Henry Mountains
19. Central Mountains

## Southern Region – Phone: 435-865-6100

20. Southwest Desert
21. Filmore
22. Beaver
23. Monroe
24. Mt. Dutton
25. Plateau
26. Kaiparowitz
27. Paunsaugunt
28. Panguitch Lake
29. Zion
30. Pine Valley

For copies of individual plans, please contact the UDWR at 801-538-7306 or the following address:

Utah Division of Wildlife Resources  
Salt Lake Office  
1594 W. North Temple  
Salt Lake City, UT 84114

CONSERVATION AGREEMENTS AND STRATEGIES

Bonneville Cutthroat Trout Conservation Agreement and Strategy 1997 *and* Range-Wide Conservation Agreement and Strategy, 2000

<http://www.wildlife.utah.gov/pdf/cacs7.pdf>

The UDWR leads and chairs the Bonneville Cutthroat Trout Conservation Committee in an effort to conserve this species that occurs in the Bonneville Basin in western Utah, southeast Idaho and northwest Nevada. Conservation efforts have been sufficient that the USFWS issued a finding in 2001 that listing of this species wasn't warranted. The UDWR is in the process of completing a five-year progress report for Utah and will write a new state Conservation Agreement and Strategy.

Colorado River Cutthroat Trout Conservation Agreement and Strategy, Utah, 1997 *and* Conservation Agreement and Strategy for Colorado River Cutthroat Trout in the States of Colorado, Utah and Wyoming, 2001

<http://wildlife.state.co.us/aquatic/cutthroat/ConservationAgmt.pdf>

The UDWR leads conservation efforts for this species in Utah and is a member of the Tri-State efforts in Colorado, Utah and Wyoming. Conservation efforts have been sufficient for the USFWS to issue a finding of Listing Not Warranted in 2004. The Tri-State group just completed a large effort to build a GIS database covering Colorado River cutthroat trout populations within the three states. Both documents will be reviewed within the next three years to further define where additional conservation efforts should be conducted.

Columbia Spotted Frog Conservation Agreement and Strategy, 1998

<http://www.wildlife.utah.gov/pdf/spotfrog.pdf>

The UDWR has been leading efforts to conserve this species that occurs along the Wasatch Front and in the West Desert of Utah, then north to Alaska. Efforts to benefit the frog, under the direction of partners in a conservation team, were sufficient to allow for a determination of a “not warranted for listing” finding in response to petitioners. A six-year assessment documenting these efforts is being completed. The revised document is being reviewed by the signatories and should be signed in 2005.

Greater Sage-grouse Rangewide Conservation Assessment (WAFWA)

[http://sagemap.wr.usgs.gov/docs/Greater\\_Sage-grouse\\_Conservation\\_Assessment\\_060404.pdf](http://sagemap.wr.usgs.gov/docs/Greater_Sage-grouse_Conservation_Assessment_060404.pdf)

This report assesses the ecological status and potential factors that influence Greater Sage-grouse and sagebrush habitats across their entire distribution using a large-scale approach to identify regional patterns of habitat, disturbance, land use practices, and population trends. The Conservation Assessment includes background information on Greater Sage-grouse and sagebrush habitats, information on the basic ecology of Greater Sage-grouse and sagebrush habitats, a description of the current population trends, identification of the dominant factors that influence sagebrush habitats, and an integration of habitat and population trend information into a synthesis of the conservation status for Greater Sage-grouse and sagebrush ecosystems in western North America.

Gunnison Prairie Dog Conservation Assessment (WAFWA) (rangewide - incomplete)

This report assesses the ecological status and limiting factors of Gunnison prairie dog conservation across the species’ entire distribution using a large-scale approach. The Conservation Assessment includes background information on Gunnison prairie dogs and their habitats, information on the basic ecology of Gunnison prairie dogs, and a description of the current population status and distribution. This document will be followed by a rangewide conservation strategy.

Gunnison Sage-grouse (UDWR – southeastern Utah)

<http://www.wildlife.utah.gov/uplandgame/pdf/gsgcp.pdf>

This plan was initiated to conserve the species by reducing threats to the Gunnison Sage-grouse, stabilizing the population, and maintaining its ecosystem. This document’s primary purpose is to conserve this species by implementing the voluntary conservation actions described in this plan.

#### Least Chub Conservation Agreement and Strategy, 1998

The UDWR has been leading the efforts to conserve this species under the direction of partners in a conservation team. It occurs in a few small habitats along the Wasatch Front and in the West Desert of Utah. A six-year assessment documenting these efforts is being completed. The revised Conservation Agreement and Strategy is being reviewed by the signatories and should be signed in 2005.

#### Memorandum of Agreement for Conservation and Management of Yellowstone Cutthroat Trout among Montana, Idaho, Wyoming, Nevada, Utah, U.S. Forest Service, Yellowstone National Park and Grand Teton National Park, 2000

<http://mountain-prairie.fws.gov/species/fish/yct/Microsoft%20Word%20-%20YCT-MOU.pdf>

UDWR is a signatory to this MOA for the conservation of Yellowstone cutthroat trout. A very small portion of the historic range for Yellowstone cutthroat trout extends into northwest Utah. The USFWS has continuously found that listing of this species is not warranted.

#### Northern Goshawk (USFS – statewide)

<http://www.fs.fed.us/r4/goshawk/strategy.pdf>

This document provides a management strategy for Utah's National Forests, the Bureau of Land Management and the UDWR to maintain adequate nesting and foraging Northern Goshawk habitat that is well connected throughout the state in order to sustain a viable population of Goshawks. The agreement and strategy is tiered to several technical documents also provided on the web site.

#### Range-wide Conservation Agreement for Roundtail Chub, Bluehead Sucker, and Flannelmouth Sucker, 2004

<http://www.wildlife.utah.gov/pdf/rcbsfs.pdf>

With the support of the Colorado River Fish and Wildlife Council, the conservation agreement for these species was signed in 2004. This document directs that both a species conservation strategy and individual state management plans be developed. The Wildlife Council approved the Range-wide Conservation Strategy in 2005. The six state signatory agencies, including Utah, are all finalizing state management plans for these species.

#### Rangewide Gunnison Sage-grouse Conservation Plan (UDWR/Colorado Division of Wildlife - incomplete)

[http://wildlife.state.co.us/species\\_cons/Gunnison\\_sage\\_grouse/index.asp](http://wildlife.state.co.us/species_cons/Gunnison_sage_grouse/index.asp)

This comprehensive conservation plan was developed to protect, enhance, and conserve Gunnison Sage-grouse populations and their habitats, by providing a rangewide perspective, as well as guidance and recommendations to local working groups and other interested or affected parties and stakeholders. The plan seeks to remove this species from federal listing consideration.

### Virgin Spinedace Conservation Agreement and Strategy, 2002

<http://www.wildlife.utah.gov/pdf/virgspin.pdf>

The Virgin spinedace is endemic to the Virgin River drainage of Utah where populations of the fish fluctuate but are generally stable at low levels. This conservation agreement was originally signed in 1998 and was re-authorized in 2002. The UDWR has been leading the efforts to conserve this species under the direction of partners in a conservation team. Funding and cooperative efforts received from the Virgin River Resource Management and Recovery Team support the work specified in the Virgin spinedace Conservation Agreement and Strategy.

### White-tailed Prairie Dog Conservation Assessment (WAFWA - rangewide)

This report assesses the ecological status and limiting factors of white-tailed prairie dog conservation across the species' entire distribution using a large-scale approach. The conservation assessment includes background information on white-tailed prairie dogs and their habitats, information on the basic ecology of the white-tailed prairie dog, and a description of the current population status and distribution. This document is being followed by a rangewide conservation strategy.

## MONITORING PLANS

### Coordinated Bird Monitoring

This plan provides quantitative objectives for addressing important avian and habitat management issues in Utah; it also identifies the best methods for collecting the needed information, provides estimated sample size requirements, identifies responsibilities for implementation, and makes recommendations on project management and the next steps toward implementation.

### Peregrine Falcon Post-delisting

<http://www.fs.fed.us/r4/goshawk/strategy.pdf>

This plan was developed by the USFWS in cooperation with state and non-government agencies to determine the recovery of the Peregrine Falcon after federal delisting. Suggested research and monitoring efforts were designed to detect declines in territory occupancy, nest success, and productivity across the United States. Regional data for all population measures are to be combined to examine trends nationwide.

## HABITAT PLANS

### Box Elder County Comprehensive Wetlands Management Plan (1997)

[http://137.77.133.41/wetlands/pdf/box\\_elder\\_wetland\\_conservation\\_plan.pdf](http://137.77.133.41/wetlands/pdf/box_elder_wetland_conservation_plan.pdf)

This management plan seeks to conserve and enhance the integrity and ensure perpetuation of the Great Salt Lake wetland ecosystem in Box Elder County, while incorporating provisions for appropriate urban development, infrastructure needs, resident livelihoods, and quality of life. It is a county-specific wetland protection plan detailing specific areas within the county, but countywide in scope.

### Davis County Wetlands Conservation Plan (1996)

This plan proposes a more predictable approach to wetland regulation in Davis County, easing restrictions while conserving critical bands of wetlands. Thus, it aims to ease strains on private landowners while simultaneously ensuring better wetlands for future generations. Plan objectives include wetland conservation, wetland education and outdoor recreation.



Great Salt Lake Comprehensive Management Plan. Great Salt Lake Planning Team. 2000 (May). Resource and Planning Documents

[http://www.wildlife.utah.gov/gsl/gsl\\_cmp\\_resource\\_doc/gsl\\_cmp\\_resource\\_doc.pdf](http://www.wildlife.utah.gov/gsl/gsl_cmp_resource_doc/gsl_cmp_resource_doc.pdf)

[http://www.wildlife.utah.gov/gsl/gsl\\_cmp\\_decision\\_doc/gsl\\_cmp\\_decision\\_doc.pdf](http://www.wildlife.utah.gov/gsl/gsl_cmp_decision_doc/gsl_cmp_decision_doc.pdf)

The purposes of the Great Salt Lake Planning project are to establish management objectives and policies, coordinate management, planning, and research, improve interregional coordination, develop a resource management plan, and establish processes for plan implementation. The Decision Document contains an overview of the planning process, implementation, monitoring and research, and goals and objectives. The Resource Document is the supporting reference for the Decision Document.

Shrubsteppe and Riparian Habitat Initiatives (DWR)

The Habitat Initiative targets shrub steppe and riparian areas for a variety of conservation measures and stresses active restoration, and the implementation of improved management practices to improve range trend in these two priority areas. The three strategies of this initiative are direct habitat restoration, enhancing and improving management policy, and communication outreach.

Utah Lake Wetland Preserve Plan (1994)

This plan was produced to guide acquisition and initial management of the Preserve. Goals include offsetting wetland loss, enhancing wildlife habitat, preserving natural areas, providing outdoor recreation, and promoting wetlands education and research.

#### OTHER STATEWIDE PLANS

Establishing a Legacy for Trails in Utah 2002-2004, A Public Planning Process. Salt Lake City, Utah. Division of Utah State Parks and Recreation

The objective of this initiative set forth by the governor was to improve the quality of life and outdoor recreation by building 715 miles of premier trails, open to hiking, off-roading, horseback riding and biking within a 15-minute drive of state citizen.

Objectives included improving public access, agency coordination, economic benefits, and business growth.

State Water Plan. 2001. Utah Division of Water Resources. Salt Lake City, UT.

<http://www.water.utah.gov/waterplan/uwrpff/Cover.htm>

The plan estimates Utah's available water supply, makes projections of water need, explores how these needs will most efficiently be met, and discusses other important values, including water quality and the environment. The plan suggests implementing agricultural water transfers, agricultural water-use efficiency, conjunctive use, aquifer storage and recovery, secondary water systems, cooperative water operating agreements, and water reuse.

Utah State Comprehensive Outdoor Recreation Plan. Utah Department of Natural Resources, Division of Parks and Recreation. 2003. SLC: Utah State Parks and Recreation, 107 pp.

The purposes of this plan include developing a strategic reference document, assisting outdoor recreation planning and management, proposing actions and goals, providing a citizen-input forum for suggestions, facilitating coordination for recreation development by multiple agencies and interests, and assisting decision-making. The recreation plan includes a discussion of Utah's outdoor recreation resources and programs as they relate to the plan's purposes.



Vision 2010 Strategic Plan—A System Plan to Guide Utah State Parks and Recreation Into the 21st Century. 1996. Utah Division of Parks and Recreation.

This cooperative plan outlines the future of recreation in Utah and stresses government improvement and the enhancement of the quality of life in the state through three general areas: parks, programs, and employees serving the public. The plan addresses issues facing the parks, people, and programs, and offers recommendations and implementation ideas specific to each issue.

## CHAPTER 5 . SPECIES OF GREATEST CONSERVATION NEED

### (Element 1)

The Utah Division of Wildlife Resources (UDWR) has adopted a three-tiered system to group species in order of greatest conservation need (Table 5.1 and Appendix L). The tiered ranking system defines and prioritizes Utah's native animal species according to conservation need. Additionally, species for which the UDWR does not yet have sufficient information to make a determination of conservation status are also on the list. Tier I includes federally Threatened and Endangered, federal Candidate, and Conservation Agreement species. These species are listed on the Utah Sensitive Species List (see: [www.wildlife.utah.gov/ucdc/ViewReports/sslist.htm](http://www.wildlife.utah.gov/ucdc/ViewReports/sslist.htm)). Most Tier I species have recovery plans or conservation agreements and associated strategies (see Chapter 4); a recovery plan is not required for federal Candidates. In cooperation with agency and private partners, UDWR has initiated conservation agreements for a few of the federal Candidate species. Recovery plans and conservation agreements have been developed by multiple parties indicating the breadth of support among agencies and other interested parties for the actions required in these documents. The recovery plans and conservation agreements include recommended conservation actions that are based on the best science available at the time of preparation. These actions have been vetted by partners and are reviewed at regular intervals, usually on an annual schedule. Many actions for Tier I species are currently being implemented. When new information becomes available, it is evaluated through peer review by the appropriate standing committees defined in the plans or agreements, and actions are modified as determined by the committees.

The species on the Tier II list are generally equivalent to the Utah Species of Concern List (see: [www.wildlife.utah.gov/ucdc/ViewReports/sslist.htm](http://www.wildlife.utah.gov/ucdc/ViewReports/sslist.htm)) (UDWR 2005), which is another subset of the State Sensitive Species List. The State of Utah rule establishing the Sensitive Species List required justification of the Species of Concern in individual species accounts. A panel of expert biologists from the UDWR was convened to develop the State Sensitive Species List. The information they considered included:

- a. Species biology, life history
- b. Population – abundance, conditions
- c. Distribution
- d. Threats

The panel developed a list of native species that were believed to be of greatest conservation need based on these parameters. Agency reports, published peer-reviewed literature, and personal knowledge were all used to support the list (see UDWR 2005 for comprehensive literature cited). Once this list was completed, it was cross-referenced with the Utah Natural Heritage rankings and a very high degree of correlation was observed. The correlation with the independently developed Natural Heritage rankings provided some measure of confirmation that the Species of Concern List was accurate.

The Species of Concern list was reviewed by an internal Utah Department of Natural Resources committee, chaired by the Executive Director, edited in accord with their direction (especially to clarify and further support species accounts), and was subsequently approved. The list was presented to the Wildlife Board and approved in December 2003. By inclusion in the CWCS, additional partners now have the opportunity to review the Species of Concern List.

Tier III species were identified in the same process as that for Tier II species. The Tier III list includes species that are of conservation concern because they are linked to an at-risk habitat (e.g. mule deer), have had a substantial decrease in population size, or there is little information available, especially information regarding the species' life history, population status, and threats. Accordingly, the primary action currently described for the Tier III species is to gather more information regarding their status and any threats to them or their habitats. The lack of information itself was deemed of sufficient importance to constitute a threat.

The tiered ranking system provides a foundation that the UDWR can return to on a regular basis throughout the life of the CWCS. It documents the UDWR's understanding of the state of native species. This foundation provides a perspective for managers to prioritize and evaluate their current activities for relevance to all native species and to help ensure that species of conservation need are not neglected. It also provides a reference point for USFWS reviewers evaluating UDWR activities and proposals. The tabular format (Table 6.1) allows for ready reference, but also lends itself to updating as more information and data become available.

Species-specific distribution and abundance information is described briefly in Table 6.1. More detailed information can be found for Tier I species in USFWS Recovery Plans and UDWR Conservation Strategies (see Chapter 4). The Utah Sensitive Species List (UDWR 2005) provides detailed information on Tier II species. A comprehensive review of most Tier III bird species is provided in the Utah Avian Conservation Strategy (Parrish et al. 2002). Status review of all other Tier III species is summarized for the first time in Table 6.1.

**Table 5.1. Utah CWCS Tier I, II, and III Species List**

<b>Common Name</b>	<b>Scientific Name</b>	<b>Tier</b>	<b>Group</b>	<b>Primary Habitat</b>	<b>Secondary Habitat</b>
Columbia Spotted Frog	<i>Rana luteiventris</i>	I	Amphibian	Wetland	Wet Meadow
Relict Leopard Frog - extirpated	<i>Rana onca</i>	I	Amphibian	Wetland	Water - Lotic
Bald Eagle	<i>Haliaeetus leucocephalus</i>	I	Bird	Lowland Riparian	Agriculture
California Condor	<i>Gymnogyps californianus</i>	I	Bird	Cliff	
Gunnison Sage-grouse	<i>Centrocercus minimus</i>	I	Bird	Shrubsteppe	
Mexican Spotted Owl	<i>Strix occidentalis lucida</i>	I	Bird	Cliff	Lowland Riparian
Northern Goshawk	<i>Accipiter gentilis</i>	I	Bird	Mixed Conifer	Aspen
Southwestern Willow Flycatcher	<i>Empidonax traillii extimus</i>	I	Bird	Lowland Riparian	Mountain Riparian
Whooping Crane - extirpated	<i>Grus americana</i>	I	Bird	Wetland	Agriculture
Yellow-billed Cuckoo	<i>Coccyzus americanus</i>	I	Bird	Lowland Riparian	Agriculture
Bluehead Sucker	<i>Catostomus discobolus</i>	I	Fish	Water - Lotic	Mountain Riparian
Bonneville Cutthroat Trout	<i>Oncorhynchus clarki utah</i>	I	Fish	Water - Lotic	Mountain Riparian
Bonytail	<i>Gila elegans</i>	I	Fish	Water - Lotic	
Colorado Pikeminnow	<i>Ptychocheilus lucius</i>	I	Fish	Water - Lotic	
Colorado River Cutthroat Trout	<i>Oncorhynchus clarki pleuriticus</i>	I	Fish	Water - Lotic	Mountain Riparian
Flannelmouth Sucker	<i>Catostomus latipinnis</i>	I	Fish	Water - Lotic	
Humpback Chub	<i>Gila cypha</i>	I	Fish	Water - Lotic	
June Sucker	<i>Chasmistes liorus</i>	I	Fish	Water - Lentic	Water - Lotic
Lahontan Cutthroat Trout	<i>Oncorhynchus clarki henshawi</i>	I	Fish	Water - Lotic	Mountain Riparian
Least Chub	<i>Notichthys phlegethontis</i>	I	Fish	Water - Lentic	Wetland
Razorback Sucker	<i>Xyrauchen texanus</i>	I	Fish	Water - Lotic	
Roundtail Chub	<i>Gila robusta</i>	I	Fish	Water - Lotic	
Virgin Spinedace	<i>Lepidomeda mollispinis mollispinis</i>	I	Fish	Water - Lotic	Lowland Riparian
Virgin River Chub	<i>Gila seminuda</i>	I	Fish	Water - Lotic	Lowland Riparian
Woundfin	<i>Plagopterus argentissimus</i>	I	Fish	Water - Lotic	
Black-footed Ferret	<i>Mustela nigripes</i>	I	Mammal	Grassland	High Desert Scrub
Brown (Grizzly) Bear - extirpated	<i>Ursus arctos</i>	I	Mammal	Mixed Conifer	Mountain Shrub
Canada Lynx	<i>Lynx canadensis</i>	I	Mammal	Sub-Alpine Conifer	Lodgepole Pine
Gray Wolf - extirpated	<i>Canis lupus</i>	I	Mammal	Mountain Shrub	Mixed Conifer
Utah Prairie-dog	<i>Cynomys parvidens</i>	I	Mammal	Grassland	Agriculture
Desert Valvata - extirpated	<i>Valvata utahensis</i>	I	Mollusk	Water - Lentic	
Fat-whorled Pondsnaill	<i>Stagnicola bonnevillensis</i>	I	Mollusk	Wetland	
Kanab Ambersnail	<i>Oxyloma kanabense</i>	I	Mollusk	Water - Lentic	Wetland

Common Name	Scientific Name	Tier	Group	Primary Habitat	Secondary Habitat
Ogden Rocky Mountainsnail	<i>Oreohelix peripherica wasatchensis</i>	I	Mollusk	Mountain Shrub	Rock
Desert Tortoise	<i>Gopherus agassizii</i>	I	Reptile	Low Desert Scrub	
Arizona Toad	<i>Bufo microscaphus</i>	II	Amphibian	Lowland Riparian	Wetland
Western Toad	<i>Bufo boreas</i>	II	Amphibian	Wetland	Mountain Riparian
American White Pelican	<i>Pelecanus erythrorhynchos</i>	II	Bird	Water - Lentic	Wetland
Black Swift	<i>Cypseloides niger</i>	II	Bird	Lowland Riparian	Cliff
Bobolink	<i>Dolichonyx oryzivorus</i>	II	Bird	Wet Meadow	Agriculture
Burrowing Owl	<i>Athene cunicularia</i>	II	Bird	High Desert Scrub	Grassland
Ferruginous Hawk	<i>Buteo regalis</i>	II	Bird	Pinyon-Juniper	Shrubsteppe
Grasshopper Sparrow	<i>Ammodramus savannarum</i>	II	Bird	Grassland	
Greater Sage-grouse	<i>Centrocercus urophasianus</i>	II	Bird	Shrubsteppe	
Lewis's Woodpecker	<i>Melanerpes lewis</i>	II	Bird	Ponderosa Pine	Lowland Riparian
Long-billed Curlew	<i>Numenius americanus</i>	II	Bird	Grassland	Agriculture
Sharp-tailed Grouse	<i>Tympanuchus phasianellus</i>	II	Bird	Shrubsteppe	Grassland
Short-eared Owl	<i>Asio flammeus</i>	II	Bird	Wetland	Grassland
Three-toed Woodpecker	<i>Picoides tridactylus</i>	II	Bird	Sub-Alpine Conifer	Lodgepole Pine
Bear Lake Sculpin	<i>Cottus extensus</i>	II	Fish	Water - Lentic	
Bear Lake Whitefish	<i>Prosopium abyssicola</i>	II	Fish	Water - Lentic	
Bonneville Cisco	<i>Prosopium gemmifer</i>	II	Fish	Water - Lentic	
Bonneville Whitefish	<i>Prosopium spilonotus</i>	II	Fish	Water - Lentic	
Desert Sucker	<i>Catostomus clarki</i>	II	Fish	Water - Lotic	
Leatherside Chub	<i>Gila copei</i>	II	Fish	Water - Lotic	Mountain Riparian
Yellowstone Cutthroat Trout	<i>Oncorhynchus clarki bouvieri</i>	II	Fish	Water - Lotic	Mountain Riparian
Allen's Big-eared Bat	<i>Idionycteris phyllotis</i>	II	Mammal	Lowland Riparian	Pinyon-Juniper
Big Free-tailed Bat	<i>Nyctinomops macrotis</i>	II	Mammal	Lowland Riparian	Cliff
Dark Kangaroo Mouse	<i>Microdipodops megacephalus</i>	II	Mammal	High Desert Scrub	Shrubsteppe
Fringed Myotis	<i>Myotis thysanodes</i>	II	Mammal	Northern Oak	Pinyon-Juniper
Gunnison's Prairie-dog	<i>Cynomys gunnisoni</i>	II	Mammal	Grassland	High Desert Scrub
Kit Fox	<i>Vulpes macrotis</i>	II	Mammal	High Desert Scrub	
Mexican Vole	<i>Microtus mexicanus</i>	II	Mammal	Ponderosa Pine	Aspen
Preble's Shrew	<i>Sorex preblei</i>	II	Mammal	Wetland	High Desert Scrub
Pygmy Rabbit	<i>Brachylagus idahoensis</i>	II	Mammal	Shrubsteppe	
Silky Pocket Mouse	<i>Perognathus flavus</i>	II	Mammal	Grassland	Shrubsteppe
Spotted Bat	<i>Euderma maculatum</i>	II	Mammal	Low Desert Scrub	Cliff
Townsend's Big-eared Bat	<i>Corynorhinus townsendii</i>	II	Mammal	Pinyon-Juniper	Mountain Shrub

Common Name	Scientific Name	Tier	Group	Primary Habitat	Secondary Habitat
Western Red Bat	<i>Lasiurus blossevillii</i>	II	Mammal	Lowland Riparian	
White-tailed Prairie-dog	<i>Cynomys leucurus</i>	II	Mammal	Grassland	High Desert Scrub
Bear Lake Springsnail	<i>Pyrgulopsis pilsbryana</i>	II	Mollusk	Wetland	
Bifid Duct Pyrg	<i>Pyrgulopsis peculiaris</i>	II	Mollusk	Wetland	
Black Canyon Pyrg	<i>Pyrgulopsis plicata</i>	II	Mollusk	Wetland	
Brian Head Mountainsnail	<i>Oreohelix parawanensis</i>	II	Mollusk	Mountain Shrub	Rock
California Floater	<i>Anodonta californiensis</i>	II	Mollusk	Water - Lotic	Water - Lentic
Carinate Glenwood Pyrg	<i>Pyrgulopsis inopinata</i>	II	Mollusk	Wetland	
Cloaked Physa	<i>Physa megalochlamys</i>	II	Mollusk	Wetland	
Deseret Mountainsnail	<i>Oreohelix peripherica</i>	II	Mollusk	Mountain Shrub	Rock
Desert Springsnail	<i>Pyrgulopsis deserta</i>	II	Mollusk	Wetland	
Eureka Mountainsnail	<i>Oreohelix eurekaensis</i>	II	Mollusk	Mountain Shrub	Rock
Hamlin Valley Pyrg	<i>Pyrgulopsis hamlinensis</i>	II	Mollusk	Wetland	
Longitudinal Gland Pyrg	<i>Pyrgulopsis anguina</i>	II	Mollusk	Wetland	
Lyrate Mountainsnail	<i>Oreohelix haydeni</i>	II	Mollusk	Mountain Shrub	Rock
Ninemile Pyrg	<i>Pyrgulopsis nonaria</i>	II	Mollusk	Wetland	
Northwest Bonneville Pyrg	<i>Pyrgulopsis variegata</i>	II	Mollusk	Wetland	
Otter Creek Pyrg	<i>Pyrgulopsis fusca</i>	II	Mollusk	Wetland	
Smooth Glenwood Pyrg	<i>Pyrgulopsis chamberlini</i>	II	Mollusk	Wetland	
Southern Bonneville Pyrg	<i>Pyrgulopsis transversa</i>	II	Mollusk	Wetland	
Southern Tightcoil	<i>Ogaridiscus subrupicola</i>	II	Mollusk	Rock	High Desert Scrub
Sub-globose Snake Pyrg	<i>Pyrgulopsis saxatilis</i>	II	Mollusk	Wetland	
Utah Physa	<i>Physella utahensis</i>	II	Mollusk	Wetland	
Western Pearlshell	<i>Margaritifera falcata</i>	II	Mollusk	Water - Lotic	Mountain Riparian
Wet-rock Physa	<i>Physella zionis</i>	II	Mollusk	Cliff	Wetland
Yavapai Mountainsnail	<i>Oreohelix yavapai</i>	II	Mollusk	Aspen	Rock
Common Chuckwalla	<i>Sauromalus ater</i>	II	Reptile	High Desert Scrub	Low Desert Scrub
Cornsnake	<i>Elaphe guttata</i>	II	Reptile	Lowland Riparian	Pinyon-Juniper
Desert Iguana	<i>Dipsosaurus dorsalis</i>	II	Reptile	Low Desert Scrub	
Desert Night Lizard	<i>Xantusia vigilis</i>	II	Reptile	Low Desert Scrub	Pinyon-Juniper
Gila Monster	<i>Heloderma suspectum</i>	II	Reptile	Low Desert Scrub	
Mojave Rattlesnake	<i>Crotalus scutulatus</i>	II	Reptile	Low Desert Scrub	
Sidewinder	<i>Crotalus cerastes</i>	II	Reptile	Low Desert Scrub	
Smooth Greensnake	<i>Opheodrys vernalis</i>	II	Reptile	Mountain Riparian	Wet Meadow
Speckled Rattlesnake	<i>Crotalus mitchellii</i>	II	Reptile	Low Desert Scrub	

Common Name	Scientific Name	Tier	Group	Primary Habitat	Secondary Habitat
Western Banded Gecko	<i>Coleonyx variegatus</i>	II	Reptile	Low Desert Scrub	Pinyon-Juniper
Western Threadsnake	<i>Leptotyphlops humilis</i>	II	Reptile	Lowland Riparian	Low Desert Scrub
Zebra-tailed Lizard	<i>Callisaurus draconoides</i>	II	Reptile	Low Desert Scrub	Shrubsteppe
Canyon Treefrog	<i>Hyla arenicolor</i>	III	Amphibian	Lowland Riparian	Water - Lotic
Great Plains Toad	<i>Bufo cognatus</i>	III	Amphibian	High Desert Scrub	Grassland
Mexican Spadefoot	<i>Spea multiplicata</i>	III	Amphibian	Pinyon-Juniper	Grassland
Northern Leopard Frog	<i>Rana pipiens</i>	III	Amphibian	Wetland	Lowland Riparian
Pacific Treefrog	<i>Pseudacris regilla</i>	III	Amphibian	Lowland Riparian	Mountain Riparian
Plains Spadefoot	<i>Spea bombifrons</i>	III	Amphibian	Pinyon-Juniper	Grassland
Abert's Towhee	<i>Pipilo aberti</i>	III	Bird	Lowland Riparian	
American Avocet	<i>Recurvirostra americana</i>	III	Bird	Wetland	Playa
Band-tailed Pigeon	<i>Columba fasciata</i>	III	Bird	Ponderosa Pine	Mixed Conifer
Bell's Vireo	<i>Vireo bellii</i>	III	Bird	Lowland Riparian	
Bendire's Thrasher	<i>Toxostoma bendirei</i>	III	Bird	Low Desert Scrub	
Black Rosy-finch	<i>Leucosticte atrata</i>	III	Bird	Alpine	Grassland
Black-necked Stilt	<i>Himantopus mexicanus</i>	III	Bird	Wetland	Playa
Black-throated Gray Warbler	<i>Dendroica nigrescens</i>	III	Bird	Pinyon-Juniper	Mountain Shrub
Boreal Owl	<i>Aegolius funereus</i>	III	Bird	Sub-Alpine Conifer	
Brewer's Sparrow	<i>Spizella breweri</i>	III	Bird	Shrubsteppe	High Desert Scrub
Broad-tailed Hummingbird	<i>Selasphorus platycercus</i>	III	Bird	Lowland Riparian	Mountain Riparian
Caspian Tern	<i>Sterna caspia</i>	III	Bird	Playa	Water - Lentic
Crissal Thrasher	<i>Toxostoma crissale</i>	III	Bird	Low Desert Scrub	Lowland Riparian
Gambel's Quail	<i>Callipepla gambelii</i>	III	Bird	Low Desert Scrub	Lowland Riparian
Gray Vireo	<i>Vireo vicinior</i>	III	Bird	Pinyon-Juniper	Northern Oak
Lucy's Warbler	<i>Vermivora luciae</i>	III	Bird	Lowland Riparian	Low Desert Scrub
Mountain Plover	<i>Charadrius montanus</i>	III	Bird	High Desert Scrub	
Osprey	<i>Pandion haliaetus</i>	III	Bird	Water - Lentic	Water - Lotic
Peregrine Falcon	<i>Falco peregrinus</i>	III	Bird	Cliff	Lowland Riparian
Sage Sparrow	<i>Amphispiza belli</i>	III	Bird	Shrubsteppe	High Desert Scrub
Sage Thrasher	<i>Oreoscoptes montanus</i>	III	Bird	Shrubsteppe	High Desert Scrub
Snowy Plover	<i>Charadrius alexandrinus</i>	III	Bird	Playa	
Virginia's Warbler	<i>Vermivora virginiae</i>	III	Bird	Northern Oak	Pinyon-Juniper
Williamson's Sapsucker	<i>Sphyrapicus thyroideus</i>	III	Bird	Sub-Alpine Conifer	Aspen
Longnose Dace	<i>Rhinichthys cataractae</i>	III	Fish	Water - Lotic	Mountain Riparian
Paiute Sculpin	<i>Cottus beldingi</i>	III	Fish	Water - Lotic	Mountain Riparian

Common Name	Scientific Name	Tier	Group	Primary Habitat	Secondary Habitat
Redside Shiner	<i>Richardsonius balteatus</i>	III	Fish	Water - Lotic	Lowland Riparian
Speckled Dace	<i>Rhinichthys osculus</i>	III	Fish	Water - Lotic	Lowland Riparian
Utah Chub	<i>Gila atraria</i>	III	Fish	Water - Lotic	Lowland Riparian
Utah Lake Sculpin - extinct	<i>Cottus echinatus</i>	III	Fish	Water - Lentic	
Utah Sucker	<i>Catostomus ardens</i>	III	Fish	Water - Lotic	Lowland Riparian
Abert's Squirrel	<i>Sciurus aberti</i>	III	Mammal	Ponderosa Pine	
American Marten	<i>Martes americana</i>	III	Mammal	Sub-Alpine Conifer	Lodgepole Pine
American Pika	<i>Ochotona princeps</i>	III	Mammal	Alpine	Mountain Shrub
Bighorn Sheep	<i>Ovis canadensis</i>	III	Mammal	High Desert Scrub	Shrubsteppe
Desert Kangaroo Rat	<i>Dipodomys deserti</i>	III	Mammal	Low Desert Scrub	
Desert Shrew	<i>Notiosorex crawfordi</i>	III	Mammal	Low Desert Scrub	Mountain Shrub
Dwarf Shrew	<i>Sorex nanus</i>	III	Mammal	Sub-Alpine Conifer	Alpine
Idaho Pocket Gopher	<i>Thomomys idahoensis</i>	III	Mammal	Grassland	Shrubsteppe
Merriam's Shrew	<i>Sorex merriami</i>	III	Mammal	Shrubsteppe	Grassland
Mule Deer	<i>Odocoileus hemionus</i>	III	Mammal	Shrubsteppe	Mountain Shrub
Northern Flying Squirrel	<i>Glaucomys sabrinus</i>	III	Mammal	Sub-Alpine Conifer	
Northern River Otter	<i>Lontra canadensis</i>	III	Mammal	Mountain Riparian	Lowland Riparian
Northern Rock Mouse	<i>Peromyscus nasutus</i>	III	Mammal	Rock	Pinyon-Juniper
Olive-backed Pocket Mouse	<i>Perognathus fasciatus</i>	III	Mammal	Shrubsteppe	Grassland
Stephen's Woodrat	<i>Neotoma stephensi</i>	III	Mammal	Pinyon-Juniper	Rock
Spotted Ground Squirrel	<i>Spermophilus spilosoma</i>	III	Mammal	Grassland	High Desert Scrub
Thirteen-lined Ground Squirrel	<i>Spermophilus tridecemlineatus</i>	III	Mammal	Grassland	
Wolverine	<i>Gulo gulo</i>	III	Mammal	Sub-Alpine Conifer	
Wyoming Ground Squirrel	<i>Spermophilus elegans</i>	III	Mammal	Shrubsteppe	High Desert Scrub
Yuma Myotis	<i>Myotis yumanensis</i>	III	Mammal	Lowland Riparian	Low Desert Scrub
Black Gloss	<i>Zonitoides nitidus</i>	III	Mollusk	Mountain Riparian	
Creeping Ancyliid	<i>Ferrissia rivularis</i>	III	Mollusk	Wetland	
Cross Snaggletooth	<i>Gastrocopta quadridens</i>	III	Mollusk	Mountain Riparian	
Glass Physa	<i>Physa skinneri</i>	III	Mollusk	Wetland	Water - Lentic
Glossy Valvata	<i>Valvata humeralis</i>	III	Mollusk	Wetland	Water - Lentic
Mill Creek Mountainsnail	<i>Oreohelix howardi</i>	III	Mollusk	Mixed Conifer	
Montane Snaggletooth	<i>Gastrocopta pilsbryana</i>	III	Mollusk	Mountain Riparian	
Ovate Vertigo	<i>Vertigo ovata</i>	III	Mollusk	Pinyon-Juniper	
Ribbed Dagger	<i>Pupoides hordaceus</i>	III	Mollusk	Lowland Riparian	
Rocky Mountain Dusksnail	<i>Colligyrus greggi</i>	III	Mollusk	Wetland	



<b>Common Name</b>	<b>Scientific Name</b>	<b>Tier</b>	<b>Group</b>	<b>Primary Habitat</b>	<b>Secondary Habitat</b>
Sharp Sprite	<i>Promenetus exacuus</i>	III	Mollusk	Wetland	Water - Lentic
Sluice Snaggletooth	<i>Gastrocopta ashmuni</i>	III	Mollusk	Lowland Riparian	
Black-necked Garter Snake	<i>Thamnophis cyrtopsis</i>	III	Reptile	Lowland Riparian	
Coachwhip	<i>Masticophis flagellum</i>	III	Reptile	Grassland	Low Desert Scrub
Common Gartersnake	<i>Thamnophis sirtalis</i>	III	Reptile	Wetland	Wet Meadow
Common Kingsnake	<i>Lampropeltis getula</i>	III	Reptile	Low Desert Scrub	Pinyon-Juniper
Glossy Snake	<i>Arizona elegans</i>	III	Reptile	Grassland	Low Desert Scrub
Groundsnake	<i>Sonora semiannulata</i>	III	Reptile	Low Desert Scrub	
Lesser Earless Lizard	<i>Holbrookia maculata</i>	III	Reptile	Low Desert Scrub	Grassland
Long-nosed Leopard Lizard	<i>Gambelia wislizenii</i>	III	Reptile	Low Desert Scrub	High Desert Scrub
Long-nosed Snake	<i>Rhinocheilus lecontei</i>	III	Reptile	High Desert Scrub	Shrubsteppe
Many-lined Skink	<i>Eumeces multivirgatus</i>	III	Reptile	Ponderosa Pine	Mountain Shrub
Milksnake	<i>Lampropeltis triangulum</i>	III	Reptile	High Desert Scrub	Shrubsteppe
Nightsnake	<i>Hypsiglena torquata</i>	III	Reptile	Pinyon-Juniper	High Desert Scrub
Plateau Striped Whiptail	<i>Aspidoscelis velox</i>	III	Reptile	Pinyon-Juniper	Desert Oak
Ring-necked Snake	<i>Diadophis punctatus</i>	III	Reptile	Pinyon-Juniper	Shrubsteppe
Rubber Boa	<i>Charina bottae</i>	III	Reptile	Mountain Riparian	Mixed Conifer
Smith's Black-headed Snake	<i>Tantilla hobartsmithi</i>	III	Reptile	Low Desert Scrub	Lowland Riparian
Sonora Mountain Kingsnake	<i>Lampropeltis pyromelana</i>	III	Reptile	Pinyon-Juniper	Mountain Riparian
Spotted Leaf-nosed Snake	<i>Phyllorhynchus decurtatus</i>	III	Reptile	Low Desert Scrub	
Western Lyresnake	<i>Trimorphodon biscutatus</i>	III	Reptile	Low Desert Scrub	Lowland Riparian
Western Patch-nosed Snake	<i>Salvadora hexalepis</i>	III	Reptile	Low Desert Scrub	
Western Skink	<i>Eumeces skiltonianus</i>	III	Reptile	Pinyon-Juniper	Mountain Shrub

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## **CHAPTER 6 . THREATS AND CONSERVATION ACTIONS FOR UTAH’S SPECIES**

(Elements 1, 3 and 4)

In this chapter we provide descriptions of problems (i.e., threats) that adversely affect Utah’s Species of Greatest Conservation Need. We also present conservation actions that will be used to address those problems. Species and habitats are presented separately because they have historically been evaluated by different methods and using different metrics. In the Comprehensive Wildlife Conservation Strategy (CWCS) the Utah Division of Wildlife Resources (UDWR) has presented methods and metrics that are designed to be as consistent as possible, using the same general threats and general conservation actions for species and habitats where doing so is logical (Tables 6.1 and 8.1).

We have developed a list of general threats that potentially impact Utah’s species (provided at the start of Table 6.1). For each of the animal species, we assign one or more general threat categories and then provide more detailed, yet concise, descriptions of the specific threats affecting each species. We also provide both general conservation actions and specific conservation actions that will help address the threats and conserve the affected species. Finally, we designate specific conservation actions for implementation within species groups (e.g., birds, mammals, fishes) as high, medium, or low priority. Research and monitoring, using standardized protocols (Appendix J), are conservation actions that are often necessary when little information is available. Biologists must determine the life history and requirements for a species before they can develop, prioritize, and implement meaningful, constructive management and conservation actions.

Tables 6.1 and 8.1 are structured to allow the reader to relate the species biology, life history, abundance, and distribution as well as the factors that threaten the species and its habitats, to the actions recommended to address those threats. The biology, habitats, and conservation of Tier I species are addressed much more exhaustively in the relevant conservation documents for those species which may include recovery plans and conservation agreement and strategy documents.

**Table 6.1. Species Accounts for Utah's Species of Greatest Conservation Need****General Threats****(including but not limited to):**

Development: the construction of buildings, subdivisions, roads, and other structures associated with human habitation/use; includes agricultural, industrial, and residential impacts

Disease: an impairment of health on a scale sufficient or potentially sufficient to affect a species on the population level. The disease may be caused by bacteria, viruses, parasites, prions, fungi, or other pathogen

Energy Development: the construction of well pads, roads, and other structures associated with oil/natural gas extraction or coal mining

Environmental Contamination: the presence of harmful substances resulting from pollution or poisoning

Habitat Loss: this includes destruction, degradation and fragmentation of habitat

Harvest: population impacts resulting from unregulated, poorly regulated, or illegal harvest

High Percent of Global Population: a large proportion of a species occurs in Utah; a loss of the Utah population would seriously threaten the global population

Human Disturbance: refers to disruption caused by human presence leading to breeding site abandonment, increased risk of predation (e.g., bird flushed from nesting cover) or other behavioral disruptions leading, cumulatively, to population impacts

Hybridization: loss of genetic integrity from crossing with other taxa

Invasive Animal Species: invasion by an animal species (usually non-native or naturalized) which disrupts native populations or habitats, e.g., House Sparrow, carp, red fox

Invasive Plant Species: invasion by a plant species (usually non-native or naturalized) which disrupts native habitats, e.g., cheatgrass, tamarisk, phragmites

Lack of Information: there is an indication of a threat to the species, population, or habitat, but there is not sufficient credible scientific evidence to substantiate the threat. This also includes the special case where there is an ongoing taxonomic debate

Limited Distribution: species occurs in limited areas and/or numbers

Limited Habitat: species occurs in a restricted, declining, much reduced, or specialized habitat

Nest Parasitism: loss of productivity resulting from parasitic species such as the Brown-headed Cowbird

Water Development: altering natural water flows through diversion, storage, pumping, and/or conveyance activities

**General Conservation Actions****(including but not limited to):**

Conserve Suitable Habitat: manage suitable (possibly unoccupied) habitats to maintain suitability

Control and Monitor Contaminants: determine response of species to environmental contaminants, implement cleanup and remedial actions, monitor and regulate contaminant levels in cooperation with state and federal agencies.

Control and Monitor Disturbance: determine response of species to human disturbance and, if necessary, control the disturbance through regulation and enforcement (e.g., season closures, permanent restrictions, buffer zones, enforce existing regulations, etc.)

Control and Monitor Invasive Species: determine effects of invasive species on native species/habitats and if necessary control (e.g., trap and remove cowbirds, cut and spray tamarisk)

Determine and Map Distribution: survey for suitable habitats and occurrence of species; record results in GIS compatible format

Determine and Address Factors Limiting Recovery: determine which anthropogenic and natural factors limit (both currently and long-term) population growth and address those factors through management (e.g., provide in-stream cover for native fish if cover is limiting, modify grazing regimes if habitat is negatively affected, provide nest boxes if natural cavities are limiting)

Education and Outreach: develop public awareness and solicit public support; increase communication and cooperation of partnering agencies, private landowners and NGOs

Habitat Monitoring and Research: determine response of species to habitat changes as well as habitat restoration projects through well designed monitoring and research programs (e.g., before-after-control-impact monitoring of shrubsteppe restoration treatments)

Implement Existing Conservation Plan(s): a detailed management plan or plans already exist for the species and the plan(s) needs to be implemented

Increase Distribution: artificial enhancement of populations through captive breeding and/or transplants

Permanent Conservation of Habitat: fee title acquisitions or conservation easements

Population Monitoring and Research: this includes monitoring and research on productivity, survival, population trends and other demographic and population factors

Protect Significant Areas: protect areas important to breeding, foraging, migrating, wintering, and other life history aspects

Restore Degraded Habitats: manage previously or potentially suitable habitat to achieve or approach properly functioning condition (e.g., restore stream sinuosity and channel profiles, plant desirable vegetation, reintroduce natural disturbance regimes to plant communities)

Test and Monitor Disease: capture and test species for presence of disease, monitor population response to disease outbreaks and control effects through, for example, treatment, inoculation or removal of afflicted individuals

## Amphibians and Reptiles

<b>Arizona Toad</b>		<b>Biology and Life History</b>	<b>Population</b>	<b>Distribution</b>
<i>Bufo microscaphus</i> Tier II Amphibian		Inhabits lowland riparian habitat.	Locally abundant.	Southern portion of Utah. Concentrated within the Virgin River basin in Washington County but also known from Kane and Iron Counties.
<b>General Threats</b>	<b>Specific Threats</b>	<b>General Conservation Actions</b>	<b>Specific Conservation Actions</b>	<b>Priority</b>
Water Development	Reduction of native vegetation and extent of riparian corridors due to agricultural and municipal withdrawals	Protect Significant Areas	Prioritize and protect undisturbed riparian areas; seek opportunities to recover disturbed areas	M
Hybridization	Hybridizing with Woodhouse's toad	Population Monitoring and Research	Determine amount of introgression and degree of threat. If diversity being lost may need propagation	M

<b>Black-necked Garter Snake</b>		<b>Biology and Life History</b>	<b>Population</b>	<b>Distribution</b>
<i>Thamnophis cyrtopsis</i> Tier III Reptile		Primarily found along foothills and streams; however, habitats vary from desert to forest pine or fir.	Population size and trends not well documented, but anecdotal information suggests this species is common.	Mostly southeast Utah and southeast Colorado to western-central Guatemala.
<b>General Threats</b>	<b>Specific Threats</b>	<b>General Conservation Actions</b>	<b>Specific Conservation Actions</b>	<b>Priority</b>
Lack of Information	Complete distribution in Utah unknown	Determine and Map Distribution	Determine extent of distribution	M
Lack of information	Population status unknown	Population Monitoring and Research	Determine population status and trends	L

<b>Canyon Treefrog</b>		<b>Biology and Life History</b>	<b>Population</b>	<b>Distribution</b>
<i>Hyla arenicolor</i> Tier III Amphibian		Primarily inhabits lowland riparian areas. Occurs close to rocky washes, streams and permanent pool in arid areas.	Population size and trends unknown.	Western Colorado and southern Utah south to northern Oaxaca.
<b>General Threats</b>	<b>Specific Threats</b>	<b>General Conservation Actions</b>	<b>Specific Conservation Actions</b>	<b>Priority</b>
Lack of Information	May have limited distribution in Utah	Determine and Map Distribution	Surveys for species in southern Utah are needed; determine extent of distribution	M
Water Development	Reduced riparian areas and water sources in arid areas may negatively affect species	Control and Monitor Disturbance	Reduce withdrawals or provide alternative water and /or habitats if necessary	M
Disease	Chytridiomycosis (chytrid fungus) may negatively affect populations	Monitor Disease	Monitor populations and submit samples for testing if signs of chytrid observed	M

<b>Coachwhip</b>		<b>Biology and Life History</b>	<b>Population</b>	<b>Distribution</b>
<i>Masticophis flagellum</i> Tier III Reptile		Inhabits open, arid habitats at lower elevations. Active diurnal predator.	Populations restricted to one county in Utah. Population trend unknown.	Occurs only in the lower elevations in Washington County and along the canyons of the Colorado River in south-central Utah, but there have been limited sightings.
<b>General Threats</b>	<b>Specific Threats</b>	<b>General Conservation Actions</b>	<b>Specific Conservation Actions</b>	<b>Priority</b>
Lack of Information	May have limited distribution in Utah	Determine and Map Distribution	Surveys for species in southwest Utah are needed to determine extent of distribution and population status and trends	M

Columbia Spotted Frog		Biology and Life History	Population	Distribution
<i>Rana luteiventris</i> Tier I Amphibian		<p>Spotted frogs along the Wasatch Front generally possess a salmon color ventrally and yellow to yellow-orange coloration ventrally in the West Desert and Sanpete County, however coloration can be quite variable between populations in Utah. Spotted frog is similar to and often mistaken for the leopard frog. Specific characteristics which distinguish the spotted frog from the sympatric leopard frog include: rougher skin, shorter limbs, larger webs between the toes, smaller tympanum, and the smooth round eyes which are turned slightly upward. Other distinguishing characteristics of the leopard frog are very large conspicuous spots and a mostly white ventral surface compared to the pigmented ventral surfaces of the spotted frog. The spotted frog tends to be more of an aquatic specialist than most ranids. The majority of sightings and captures of this species have occurred while the frogs were submersed in water. Spotted frog typically inhabit a variety of habitat types including cold water ponds, streams, lakes, and springs adjacent to mixed coniferous and subalpine forest, grassland and brush land. Breeding occurs early with the spring thaw and although spotted frogs are known to use temporary bodies of water for breeding in more mesic parts of their range, in Utah, breeding sites are predominantly associated with a spring or some other permanent water source.</p>	<p>In the west desert, populations are stable within the Tule Valley and Gandy Marsh sites and are declining at Bishop Springs, Leland-Miller and Ibapah. The long-term viability of all of the west desert populations are threatened by ongoing habitat degradation from improper grazing and de-watering due to agricultural diversions. Along the Wasatch Front, populations are increasing in Heber Valley and above the Jordanelle Reservoir, stable at Diamond Fork, and are unstable at Mona/Burraston, Holladay Springs, and Springville. There is only one population, the San Pitch population, within the Sevier River Drainage and it is currently stable.</p>	<p>Columbia spotted frogs along the Wasatch Front are thought to have historically occurred in the San Pitch River, Spanish Fork River, Utah Lake, Provo River, Jordan River, and Upper Weber River Drainages. Results of a survey conducted in 1992 indicated that the distribution of spotted frogs along the Wasatch Front had declined. Spotted frogs currently occur within San Pitch River (Sanpete Valley), Spanish Fork River (Holladay Springs), Utah Lake (near Mona), Provo River (Heber Valley), and in the Upper Weber River (Francis) drainages.</p>
General Threats	Specific Threats	General Conservation Actions	Specific Conservation Actions	Priority
Disease	Risk of infection by chytrid fungus, a known lethal pathogen of amphibians worldwide	Test and Monitor disease	Monitor for chytrid fungus infection	H
Invasive Animal Species	Competition with and predation by mosquitofish ( <i>Gambusia affinis</i> )	Control and Monitor invasive species	Monitor and manage mosquitofish	M
Water Development	Habitat fragmentation due to development of streams and rivers (dams, diversions)	Restore Degraded Habitats	Habitat restoration in wetlands and along riparian corridors	M
Limited Distribution	Occurs in limited numbers	Increase Distribution	Augment populations, expand range into historical areas	H
Habitat Loss	Destruction, degradation and fragmentation of habitat	Permanent Conservation of Habitat	Pursue of conservation easements for Columbia spotted frog habitats	H

<b>Common Chuckwalla</b>		<b>Biology and Life History</b>	<b>Population</b>	<b>Distribution</b>
<i>Sauromalus ater</i> Tier II Reptile		Inhabits creosote-bursage, blackbrush and salt desert scrub.	Population size and trends unknown.	Found in the southern part of Washington County.
<b>General Threats</b>	<b>Specific Threats</b>	<b>General Conservation Actions</b>	<b>Specific Conservation Actions</b>	<b>Priority</b>
Human Disturbance	Recreation and predation by domestic animals	Protect Significant Areas	Prioritize and protect undisturbed areas with fencing or other restrictions	H
Harvest	Subject to illegal collection	Education and Outreach	Increase education efforts through schools, parks, etc.	M

<b>Common Gartersnake</b>		<b>Biology and Life History</b>	<b>Population</b>	<b>Distribution</b>
<i>Thamnophis sirtalis</i> Tier III Reptile		Primary habitat is grasslands, but this species can also be found in woodlands and forest where water is present.	Population size and trends unknown, but anecdotal information suggests this species is common.	Wide range from the Pacific to the Atlantic Coast and from southeast Alaska and south Canada to the Gulf Coast.
<b>General Threats</b>	<b>Specific Threats</b>	<b>General Conservation Actions</b>	<b>Specific Conservation Actions</b>	<b>Priority</b>
Lack of Information	Status in Utah unknown	Determine and Map Distribution	Determine extent of distribution in Utah	L

<b>Common Kingsnake</b>		<b>Biology and Life History</b>	<b>Population</b>	<b>Distribution</b>
<i>Lampropeltis getula</i> Tier III Reptile		Occurs in diverse habitats from desert shrub adjacent to agricultural areas to farmlands, canyons and warmer washes.	Locally common within its range in southern part of Utah. Population trend unknown.	Occurs across southern Utah reaching as far north as Wayne County. Abundant to the south and west of Zion National Park.
<b>General Threats</b>	<b>Specific Threats</b>	<b>General Conservation Actions</b>	<b>Specific Conservation Actions</b>	<b>Priority</b>
Lack of Information	Status in UT unknown	Population Monitoring and Research	Determine status and trends	L
Invasive Species	Salt cedar altering habitat	Protect Significant Areas	Protect habitats from invasive flora	L

<b>Cornsnake</b>		<b>Biology and Life History</b>	<b>Population</b>	<b>Distribution</b>
<i>Elaphe guttata</i> Tier II Reptile		Prefers riparian habitats near streams or river margins.	Population size and trends unknown.	Occurs in western Colorado and eastern Utah.
<b>General Threats</b>	<b>Specific Threats</b>	<b>General Conservation Actions</b>	<b>Specific Conservation Actions</b>	<b>Priority</b>
Human Disturbance	May be threatened by agriculture, municipal development	Protect Significant Areas	Prioritize and protect undisturbed areas with zoning and/or acquisitions	L
Lack of Information	Taxonomic debate about disjunct population; may be distinct species	Population Monitoring and Research	Study needed to clarify taxonomy	L
Harvest	Subject to illegal collection	Education and Outreach	Increase educational efforts in schools, parks, etc.	L

<b>Desert Iguana</b>		<b>Biology and Life History</b>	<b>Population</b>	<b>Distribution</b>
<i>Dipsosaurus dorsalis</i> Tier II Reptile		Found in creosote-bursage desert.	Population size and trends unknown.	Southwest corner of Washington County.
<b>General Threats</b>	<b>Specific Threats</b>	<b>General Conservation Actions</b>	<b>Specific Conservation Actions</b>	<b>Priority</b>
Human Disturbance	Habitat degradation due to agriculture and improper grazing, including competition for food and trampling	Conserve Suitable Habitat	Seek opportunities to protect suitable habitat	H
Harvest	Potentially subject to illegal collection	Education and Outreach	Increase education efforts in schools, parks, etc.	M

<b>Desert Night Lizard</b>		<b>Biology and Life History</b>	<b>Population</b>	<b>Distribution</b>
<i>Xantusia vigilis</i> Tier II Reptile		Inhabits arid and semiarid rocky areas. Reaches reproductive maturity after three years. Many produce only one or a few eggs per clutch per year.	Population size and trends unknown.	Occurs in the southwestern part of Washington County.
<b>General Threats</b>	<b>Specific Threats</b>	<b>General Conservation Actions</b>	<b>Specific Conservation Actions</b>	<b>Priority</b>
Human Disturbance	Recreation and increased predation by domestic animals	Protect Significant Areas	Prioritize and protect undisturbed areas with fencing	H
Development	Municipal and utility development disturbs and in some cases eliminates available habitat	Protect Significant Areas	Prioritize and protect undisturbed areas with zoning and/or acquisitions; seek opportunities for habitat restoration	L
Harvest	Potentially subject to illegal collection and very low reproductive potential	Education and Outreach	Increase education efforts	M
Limited Distribution in Utah	Limited to southwest corner of state	Protect Significant Areas	Prioritize and protect undisturbed areas	H



<b>Desert Tortoise</b> <i>Gopherus agassizii</i> Tier I Reptile		<b>Biology and Life History</b>	<b>Population</b>	<b>Distribution</b>
		Frequents desert washes, riverbanks, dunes and rocky slopes. Requires firm ground for burrow construction. Also uses shelters among rocks and exposed, eroded caliche layers in wash walls. Herbivores must have adequate ground moisture for survival of eggs and young. A clutch of 1 to 12 eggs is deposited in ground in May-July. Usually one clutch is laid per year but two clutches are possible when conditions are favorable.	In 2003, desert tortoise density estimates showed a 47% population decline within Management Zone 3 of the Red Cliff Desert Reserve and a 41% decline throughout the Reserve since regional monitoring began in 1998. Both estimates indicate a biologically significant downward trend for 2003. This trend was influenced by the severe drought in 2002, which likely contributed to the 2003 tortoise decline.	Mojave and Sonora deserts. Southwest corner of Washington County, Utah; Southern Nevada; Southeastern California; southwestern Arizona; Mexico.
<b>General Threats</b>	<b>Specific Threats</b>	<b>General Conservation Actions</b>	<b>Specific Conservation Actions</b>	<b>Priority</b>
Development	Municipal development eliminates available habitat	Habitat Monitoring and Research	Construct road culverts along heavily used roads that bisect the Reserve (e.g., Red Mountain Parkway, Cottonwood Road). Monitor culvert use. Finalize and implement tortoise fencing standards across the range of the desert tortoise	H
Disease	Upper Respiratory Track Disease	Test and Monitor Disease	Assess health of populations across the range of the desert tortoise	H
Energy Development	Utility development impacts available habitat	Habitat Monitoring and Research	Monitor habitat degradation and fragmentation from utility development projects. Control/ minimize impacts of utility development projects where feasible.	M
Habitat Loss	Habitat destruction and fragmentation	Permanent Conservation of Habitat	Acquire remaining habitat under federal ownership. Maintain habitat integrity (e.g., road closures, minimize or eliminate improper grazing)	M
Human Disturbance	Predation by domestic animals and human recreation	Control and Monitor Disturbance	Monitor recreation impacts within the Red Cliffs Desert Reserve and other areas	H
Invasive Animal Species	Predation by ravens and feral animals	Control and Monitor Invasive Species	Monitor raven predation within the Red Cliffs Desert Reserve	H

<b>Gila Monster</b> <i>Heloderma suspectum</i> Tier II Reptile		<b>Biology and Life History</b>	<b>Population</b>	<b>Distribution</b>
		Inhabits rocky canyon bottoms or washes.	Population size and trends unknown.	Found in localized portions of Washington County.
<b>General Threats</b>	<b>Specific Threats</b>	<b>General Conservation Actions</b>	<b>Specific Conservation Actions</b>	<b>Priority</b>
Human Disturbance	Predation by domestic animals and human recreation	Protect Significant Areas	Prioritize and protect undisturbed areas with fencing or other restrictions	H
Development	Municipal and industrial development eliminating available habitat	Protect Significant Areas	Prioritize and protect undisturbed areas with zoning and/or acquisitions; seek habitat restoration opportunities	M
Harvest	Subject to illegal collection	Education and Outreach	Complete and distribute educational brochure	M

<b>Glossy Snake</b>		<b>Biology and Life History</b>	<b>Population</b>	<b>Distribution</b>
<i>Arizona elegans</i> Tier III Reptile		Occurs in desert scrub habitat, including those dominated by creosote bush or blackbrush, with sandy substrate.	Known to occur in 4 counties. Population trends unknown. Species is secretive and difficult to detect.	Occurs in southern Washington and Kane Counties and southwestern Garfield and San Juan Counties.
<b>General Threats</b>	<b>Specific Threats</b>	<b>General Conservation Actions</b>	<b>Specific Conservation Actions</b>	<b>Priority</b>
Lack of Information	May have limited distribution in Utah	Determine and Map Distribution	Surveys for species in southern Utah are needed	M
Lack of Information	Taxonomic debate regarding the classification of populations as species or subspecies	Population Monitoring and Research	Include in taxonomic research by qualified researcher	L
Lack of information	Population status and trends unknown	Population Monitoring and Research	Determine population status and trends	M

<b>Great Plains Toad</b>		<b>Biology and Life History</b>	<b>Population</b>	<b>Distribution</b>
<i>Bufo cognatus</i> Tier III Amphibian		Inhabits prairie grasslands and dry, bushy areas. Breeding is dependent on rainfall.	Population size and trends unknown.	Occurs in southern and central Utah.
<b>General Threats</b>	<b>Specific Threats</b>	<b>General Conservation Actions</b>	<b>Specific Conservation Actions</b>	<b>Priority</b>
Lack of Information	May have limited distribution in UT	Determine and Map Distribution	Surveys for species in southeast UT are needed	M
Development	Agricultural, municipal, and utility development may all negatively affect by reducing available habitat	Control and Monitor Disturbance	Provide protected areas, if needed through zoning and/or acquisitions	M

<b>Groundsnake</b>		<b>Biology and Life History</b>	<b>Population</b>	<b>Distribution</b>
<i>Sonora semiannulata</i> Tier III Reptile		Prefers lower elevations with gravelly soil and sparse vegetation. Species is fossorial and requires loose soils. Also found in rocky habitat.	Population size and trend information not available. Species is extremely secretive.	Mostly recorded in Washington County with disjunct population in east Kane County (two individuals were found in 2001). Also occurs in scattered localities in southern and eastern Utah. The last observation of the species in Carbon and Uintah Counties was in 1953. There has been no documentation of the species from those counties since.
<b>General Threats</b>	<b>Specific Threats</b>	<b>General Conservation Actions</b>	<b>Specific Conservation Actions</b>	<b>Priority</b>
Lack of Information	Status in Utah unknown	Population Monitoring and Research	Determine status, trends, and threats	M
Development	Urban expansion in Washington County reducing available habitat	Control and Monitor Disturbance	Provide protected areas, if needed, with zoning and/or acquisitions	M
Environmental Contaminant	Pesticide poisoning due to consumption of insects	Control and Monitor Disturbance	Develop outreach to reduce poisoning, if needed	L

<b>Lesser Earless Lizard</b>		<b>Biology and Life History</b>	<b>Population</b>	<b>Distribution</b>
<i>Holbrookia maculata</i> Tier III Reptile		Usually found in habitats that are flat, sparsely vegetated and sandy.	Population trend unknown. Not detected in state since 1927.	One specimen collected in 1927 in southern San Juan County. Believed common in Colorado and New Mexico.
<b>General Threats</b>	<b>Specific Threats</b>	<b>General Conservation Actions</b>	<b>Specific Conservation Actions</b>	<b>Priority</b>
Lack of Information	May have limited distribution in UT	Determine and Map Distribution	Surveys for species in southeast Utah are needed	L

<b>Long-nosed Leopard Lizard</b>		<b>Biology and Life History</b>	<b>Population</b>	<b>Distribution</b>
<i>Gambelia wislizenii</i> Tier III Reptile		Primarily found in low desert scrub where sand dunes with clumps of rabbit brush are a favored habitat.	Population size and trends unknown.	Species has a wide range through all of western Utah and the Great Basin.
<b>General Threats</b>	<b>Specific Threats</b>	<b>General Conservation Actions</b>	<b>Specific Conservation Actions</b>	<b>Priority</b>
Lack of Information	Status in UT unknown	Determine and Map Distribution	Determine extent of distribution	M

<b>Long-nosed Snake</b>		<b>Biology and Life History</b>	<b>Population</b>	<b>Distribution</b>
<i>Rhinocheilus lecontei</i> Tier III Reptile		Prefers desert or prairie habitats. Secretive, not easily observed.	Population size and trends unknown.	Occurs from southwest Idaho and southeast Colorado to central Baja California.
<b>General Threats</b>	<b>Specific Threats</b>	<b>General Conservation Actions</b>	<b>Specific Conservation Actions</b>	<b>Priority</b>
Lack of Information	Status in Utah unknown	Determine and Map Distribution	Determine extent of distribution in Utah	L

<b>Many-lined Skink</b>		<b>Biology and Life History</b>	<b>Population</b>	<b>Distribution</b>
<i>Eumeces multivirgatus</i> Tier III Reptile		Species is restricted to higher elevations and montane habitat.	Only one documented population. Population trend unknown.	Known only to occur in the Abajo Mountains (San Juan County).
<b>General Threats</b>	<b>Specific Threats</b>	<b>General Conservation Actions</b>	<b>Specific Conservation Actions</b>	<b>Priority</b>
Lack of Information	Status in UT unknown	Population Monitoring and Research	Determine status, trends, and threats	M
Habitat Loss	Habitat degradation through livestock overgrazing	Permanent Conservation of Habitat	Work with agencies and/or landowners to provide high-quality protected habitat, likely with fencing	M

<b>Mexican Spadefoot</b>		<b>Biology and Life History</b>	<b>Population</b>	<b>Distribution</b>
<i>Spea multiplicata</i> Tier III Amphibian		Arid and semiarid areas. Breeding is dependent on rainfall.	Population size and trends unknown.	Found in southeastern Utah.
<b>General Threats</b>	<b>Specific Threats</b>	<b>General Conservation Actions</b>	<b>Specific Conservation Actions</b>	<b>Priority</b>
Lack of Information	May have limited distribution in Utah	Determine and Map Distribution	Surveys for species in southeast UT are needed	M
Water Development	Water withdrawals may negatively impact populations	Control and Monitor Disturbance	Determine degree of impact of water withdrawals on populations; reduce or eliminate withdrawals if needed; provide alternative water sources or habitat, if needed	M
Lack of Information	Population status and trends not well known	Population Monitoring and Research	Determine population status, trends, and threats	M
Limited Distribution	Found only in Washington County	Population Monitoring and Research	Determine population status, trends, and threats	M

<b>Milksnake</b>		<b>Biology and Life History</b>	<b>Population</b>	<b>Distribution</b>
<i>Lampropeltis triangulum</i> Tier III Reptile		Primarily in short-grass prairie or in covered grasslands.	Population size and trends unknown.	Wide distribution from Canada to Ecuador and Atlantic coast to central Utah.
<b>General Threats</b>	<b>Specific Threats</b>	<b>General Conservation Actions</b>	<b>Specific Conservation Actions</b>	<b>Priority</b>
Lack of Information	Status in Utah unknown	Population Monitoring and Research	Determine population status, trends, and threats	H
Harvest	Subject to illegal collection	Education and Outreach	Continue to work with volunteers surveyors and on legal protection; analyze and integrate volunteer data	H

<b>Mojave Rattlesnake</b>		<b>Biology and Life History</b>	<b>Population</b>	<b>Distribution</b>
<i>Crotalus scutulatus</i> Tier II Reptile		Found in scattered scrubby growth.	Population size and trends unknown.	Occurs on the Beaver Dam Slope of Washington County.
<b>General Threats</b>	<b>Specific Threats</b>	<b>General Conservation Actions</b>	<b>Specific Conservation Actions</b>	<b>Priority</b>
Human Disturbance	Recreation, persecution, and some collection pressure	Protect Significant Areas	Prioritize and protect undisturbed areas with fencing or other restrictions	H
Habitat Loss	Habitat destruction and fragmentation from municipal and utility development	Permanent Conservation of Habitat	Protect available and suitable habitat with zoning, acquisition, or other means	M

<b>Nightsnake</b>		<b>Biology and Life History</b>	<b>Population</b>	<b>Distribution</b>
<i>Hypsiglena torquata</i> Tier III Reptile		Found in both rocky and sandy areas, in habitats ranging from grassland to moist mountain meadows.	Population size and trends unknown.	Occurs mostly in the central western United States.
<b>General Threats</b>	<b>Specific Threats</b>	<b>General Conservation Actions</b>	<b>Specific Conservation Actions</b>	<b>Priority</b>
Lack of Information	Status in Utah is unknown	Determine and Map Distribution	Determine distribution in Utah	M

<b>Northern Leopard Frog</b>		<b>Biology and Life History</b>	<b>Population</b>	<b>Distribution</b>
<i>Rana pipiens</i> Tier III Amphibian		Found in grasslands, brush lands, woodlands and forest.	Population size and trends unknown.	Occurs throughout Utah.
<b>General Threats</b>	<b>Specific Threats</b>	<b>General Conservation Actions</b>	<b>Specific Conservation Actions</b>	<b>Priority</b>
Lack of Information	Status in Utah unknown	Determine and Map Distribution	Determine distribution in Utah	M
Water Development	Water development for agricultural or municipal uses may reduce available habitat	Control and Monitor Disturbance	Monitor populations at greatest risk from water or other developments; provide water and/or habitat if needed	M
Disease	Chytridiomycosis (chytrid fungus) may negatively affect populations	Monitor Population Responses to Disease	Monitor populations and submit to testing if signs of chytrid found; prevent translocations from infected populations	M

<b>Pacific Treefrog</b>		<b>Biology and Life History</b>	<b>Population</b>	<b>Distribution</b>
<i>Pseudacris regilla</i> Tier III Amphibian		Inhabits dry and swampy grassy areas.	Population size and trends unknown.	Occurs in eastern eastern Utah.
<b>General Threats</b>	<b>Specific Threats</b>	<b>General Conservation Actions</b>	<b>Specific Conservation Actions</b>	<b>Priority</b>
Lack of Information	May have limited distribution in Utah	Determine and Map Distribution	Surveys for species in western Utah are needed	M
Disease	Chytridiomycosis (chytrid fungus) may negatively affect populations	Monitor Extent of Disease	Monitor populations and submit any potential positive samples for analysis	M

<b>Plains Spadefoot</b>		<b>Biology and Life History</b>	<b>Population</b>	<b>Distribution</b>
<i>Spea bombifrons</i> Tier III Amphibian		Species occurs primarily in Pinyon-Juniper habitat, but will also reside in grasslands.	Limited information. Population trend unknown. Single specimen collected.	Poorly documented. Occurs only in the southeastern corner of Utah.
<b>General Threats</b>	<b>Specific Threats</b>	<b>General Conservation Actions</b>	<b>Specific Conservation Actions</b>	<b>Priority</b>
Lack of Information	May have limited distribution in Utah	Determine and Map Distribution	Surveys for species in southeast Utah are needed	M
Limited Distribution	Found only in Washington County	Population Monitoring and Research	Determine status, trends and threats	M

<b>Plateau Striped Whiptail</b>		<b>Biology and Life History</b>	<b>Population</b>	<b>Distribution</b>
<i>Cnemidophorus velox</i> Tier III Reptile		Typically inhabits foothills, canyons and washes in shrub dominated or Pinyon-Juniper habitat. Often found in rocky, unvegetated patches between shrubs and bunchgrasses.	Uncommon in most areas; more common in southeastern Utah. Population trend not studied due to restricted activity above ground.	Occurs primarily in the Colorado Plateau extending into the southern Bonneville Basin. Species commonly occurs throughout Natural Bridges National Monument and in one location in Zion National Park.
<b>General Threats</b>	<b>Specific Threats</b>	<b>General Conservation Actions</b>	<b>Specific Conservation Actions</b>	<b>Priority</b>
Lack of Information	Status in Utah unknown	Determine and Map Distribution	Determine extent of distribution in Utah	H
Habitat Loss	Habitat degradation due to agriculture and improper grazing	Conserve Suitable Habitat	Seek opportunities to protect suitable habitat with fencing or other restrictions	M
Invasive Plant Species	Habitat degradation due to invasion of cheatgrass	Population Monitoring and Research	Determine extent of habitat change effects on population, if needed, restore habitat or provide alternative habitats.	L
Lack of Information	Population status and trend unknown	Population Monitoring and Research	Determine population status and trends	H

<b>Ring-necked Snake</b>		<b>Biology and Life History</b>	<b>Population</b>	<b>Distribution</b>
<i>Diadophis punctatus</i> Tier III Reptile		Ranges from moist habitat to xeric conditions in juniper dominated habitat with well-developed grasses and shrub understory. Occurs primarily in habitats at elevations of between 1,750 m and 2,000 m.	Uncommon in Utah, but this is probably due to secretive behavior rather than rarity.	Occurs in the southern Bonneville Basin and Virgin River drainage.
<b>General Threats</b>	<b>Specific Threats</b>	<b>General Conservation Actions</b>	<b>Specific Conservation Actions</b>	<b>Priority</b>
Lack of Information	Status in Utah unknown	Determine and Map Distribution	Determine extent of distribution in Utah	M

<b>Rubber Boa</b> <i>Charina bottae</i> Tier III Reptile		<b>Biology and Life History</b>	<b>Population</b>	<b>Distribution</b>
		Typically occurs in rocky areas in a variety of mountain shrub, mountain riparian and forested habitats. Many localities are in canyons and high plateaus.	Population size and trend not known due to species being fossorial and difficult to detect.	Common in Wasatch and Uintah Mountains. Disjunct population in Garfield County.
<b>General Threats</b>	<b>Specific Threats</b>	<b>General Conservation Actions</b>	<b>Specific Conservation Actions</b>	<b>Priority</b>
Lack of Information	Status in UT unknown	Determine and Map Distribution	Determine extent of distribution	M
Human Disturbance	Road mortalities due to human use of habitat	Control and Monitor Disturbance	Determine extent of impact to population. Provide fencing if needed.	L
Lack of Information	Population status and trend unknown	Population Monitoring and Research	Determine population status and trends	H

<b>Sidewinder</b> <i>Crotalus cerastes</i> Tier II Reptile		<b>Biology and Life History</b>	<b>Population</b>	<b>Distribution</b>
		Found in open areas with sparse vegetation and loose sands.	Population size and trends unknown.	Found in the Mojave Desert of Washington County.
<b>General Threats</b>	<b>Specific Threats</b>	<b>General Conservation Actions</b>	<b>Specific Conservation Actions</b>	<b>Priority</b>
Human Disturbance	Recreation and persecution	Protect Significant Areas	Prioritize and protect disturbed areas	H
Habitat Loss	Habitat degradation and fragmentation	Conserve Suitable Habitat	Protect suitable undisturbed areas	M
Development	Widespread municipal development in Washington County	Control and Monitor Disturbance	Monitor species response to disturbances	H
Lack of Information	Population status and trends unknown	Population Monitoring and Research	Determine population status and trends	H

<b>Smith's Black-headed Snake</b> <i>Tantilla hobartsmithi</i> Tier III Reptile		<b>Biology and Life History</b>	<b>Population</b>	<b>Distribution</b>
		Typically occurs in rocky canyons with a variety of vegetation including desert scrub, juniper and lowland riparian.	Although seldom seen, species should not be considered rare. 18 specimens found in Kane County. Population trend unknown.	Occurs in the Colorado Plateau of southern and eastern Utah, also in Grand County. Most often reported west of the Colorado River.
<b>General Threats</b>	<b>Specific Threats</b>	<b>General Conservation Actions</b>	<b>Specific Conservation Actions</b>	<b>Priority</b>
Lack of Information	Status in Utah unknown	Determine and Map Distribution	Determine extent of distribution in Utah	H
Lack of Information	Population status and trend unknown	Population Monitoring and Research	Determine population status and trends	H

<b>Smooth Greensnake</b> <i>Opheodrys vernalis</i> Tier II Reptile		<b>Biology and Life History</b>	<b>Population</b>	<b>Distribution</b>
		Occurs in meadows and stream margins.	Population size and trends unknown.	Found in Wasatch, Uinta, Abajo and La Sal mountain ranges and in the East Tavaputs Plateau.
<b>General Threats</b>	<b>Specific Threats</b>	<b>General Conservation Actions</b>	<b>Specific Conservation Actions</b>	<b>Priority</b>
Human Disturbance	Agriculture decreases available habitat	Protect Significant Areas	Prioritize and protect undisturbed areas with fencing or other restrictions	M
Habitat Loss	Habitat degradation and fragmentation from municipal and agricultural expansion	Conserve Suitable Habitat	Prioritize and protect undisturbed areas with zoning and/or acquisitions	M
Lack of Information	Population status and trend unknown	Population Monitoring and Research	Determine population status and trend	M

<b>Sonora Mountain Kingsnake</b> <i>Lampropeltis pyromelana</i> Tier III Reptile		<b>Biology and Life History</b>	<b>Population</b>	<b>Distribution</b>
		Occurs in rocky habitats, often in canyons having open forests with a well developed, brushy understory. Also occurs near streams and springs.	Northern populations (Salt Lake and Utah Counties) have apparently been lost. Information is limited because species is secretive and rarely encountered.	Patchy distribution from Pine Valley Mountains, north through the central plateau mountains to Salt Lake and Utah Counties. Disjunct populations in Wah Wah Mountains.
<b>General Threats</b>	<b>Specific Threats</b>	<b>General Conservation Actions</b>	<b>Specific Conservation Actions</b>	<b>Priority</b>
Lack of Information	Status in Utah unknown	Determine and Map Distribution	Determine extent of distribution in Utah	H
Harvest	Subject to illegal collection	Education and Outreach	Continue to work with volunteer surveyors and on legal protection	H
Lack of Information	Population status and trend unknown	Population Monitoring and Research	Determine population status and trend	H

<b>Speckled Rattlesnake</b> <i>Crotalus mitchellii</i> Tier II Reptile		<b>Biology and Life History</b>	<b>Population</b>	<b>Distribution</b>
		Pinyon-juniper with salt desert scrub, creosote-bursage and blackbrush.	Population size and trends unknown.	Found on the Beaver Dam Slope of Washington County.
<b>General Threats</b>	<b>Specific Threats</b>	<b>General Conservation Actions</b>	<b>Specific Conservation Actions</b>	<b>Priority</b>
Human Disturbance	Recreation, development, and persecution	Protect Significant Areas	Prioritize and protect undisturbed areas with fencing or other restrictions	M
Habitat Loss	Habitat destruction and fragmentation	Conserve Suitable Habitat	Prioritize and protect undisturbed areas through zoning and/or acquisitions	M

<b>Spotted Leaf-nosed Snake</b> <i>Phyllorhynchus decurtatus</i> Tier III Reptile		<b>Biology and Life History</b>	<b>Population</b>	<b>Distribution</b>
		Prefers sandy or gravelly desert, closely associated with creosote bush.	Population trend not known due to difficulty in detecting this small, fossorial species.	One specimen was collected in southwestern Washington County in 1995.
<b>General Threats</b>	<b>Specific Threats</b>	<b>General Conservation Actions</b>	<b>Specific Conservation Actions</b>	<b>Priority</b>
Lack of Information	May have limited distribution in Utah	Determine and Map Distribution	Surveys for species in southwest Utah are needed	M

<b>Western Banded Gecko</b> <i>Coleonyx variegatus</i> Tier II Reptile		<b>Biology and Life History</b>	<b>Population</b>	<b>Distribution</b>
		Occurs in creosote-dominated vegetation in rocky areas of riparian zones.	Population size and trends unknown.	Occurs in Washington County.
<b>General Threats</b>	<b>Specific Threats</b>	<b>General Conservation Actions</b>	<b>Specific Conservation Actions</b>	<b>Priority</b>
Human Disturbance	Recreation and competition with domestic animals	Protect Significant Areas	Prioritize and protect undisturbed areas with fencing or other restrictions	H
Development	Municipal development reducing available habitat	Control and Monitor Disturbance	Monitor populations to identify areas in need of protection; seek additional protected areas, if needed	M

<b>Western Lyresnake</b>		<b>Biology and Life History</b>	<b>Population</b>	<b>Distribution</b>
<i>Trimorphodon biscutatus</i> Tier III Reptile		Typically occurs in rocky areas and dry washes in desert shrub habitat.	Limited information. Population trend unknown. Noted to be one of Utah's most obscure and rare snakes.	Known to occur in Washington County.
<b>General Threats</b>	<b>Specific Threats</b>	<b>General Conservation Actions</b>	<b>Specific Conservation Actions</b>	<b>Priority</b>
Lack of Information	Status in Utah unknown	Determine and Map Distribution	Determine extent of distribution in Utah	M

<b>Western Patch-nosed Snake</b>		<b>Biology and Life History</b>	<b>Population</b>	<b>Distribution</b>
<i>Salvadora hexalepis</i> Tier III Reptile		Prefers low, arid, open habitats, including those dominated by creosote bush, sagebrush and desert scrub.	Population size and trend unknown. Species is locally abundant in some areas.	Occurs in southern Washington and Kane Counties. Thought to be fairly common in the Mojave Desert and transition areas.
<b>General Threats</b>	<b>Specific Threats</b>	<b>General Conservation Actions</b>	<b>Specific Conservation Actions</b>	<b>Priority</b>
Lack of Information	May have limited distribution in Utah	Determine and Map Distribution	Surveys for species in southern UT are needed	M
Development	Habitat fragmentation due to residential construction in Washington County	Conserve Suitable Habitat	Protect undisturbed areas; seek additional protected areas through zoning and/or acquisitions, if needed	M

<b>Western Skink</b>		<b>Biology and Life History</b>	<b>Population</b>	<b>Distribution</b>
<i>Eumeces skiltonianus</i> Tier III Reptile		Found primarily in grassland to low desert scrub.	Population size and trends unknown.	Occurs throughout most of the Great Basin to Northern Arizona.
<b>General Threats</b>	<b>Specific Threats</b>	<b>General Conservation Actions</b>	<b>Specific Conservation Actions</b>	<b>Priority</b>
Lack of Information	Status in Utah unknown	Determine and Map Distribution	Determine extent of distribution in Utah	H

<b>Western Threadsake</b>		<b>Biology and Life History</b>	<b>Population</b>	<b>Distribution</b>
<i>Leptotyphlops humilis</i> Tier II Reptile		Found in Pinyon-Juniper habitat.	Population size and trends unknown.	Occurs in Washington County.
<b>General Threats</b>	<b>Specific Threats</b>	<b>General Conservation Actions</b>	<b>Specific Conservation Actions</b>	<b>Priority</b>
Human Disturbance	Recreation	Protect Significant Areas	Prioritize and protect undisturbed areas with fencing or other restrictions	M
Development	Municipal development reducing available habitat	Conserve Suitable Habitat	Prioritize and protect undisturbed areas through zoning and/or acquisitions as needed	M



<b>Western Toad</b>		<b>Biology and Life History</b>	<b>Population</b>	<b>Distribution</b>
<i>Bufo boreas</i> Tier II Amphibian		Found in high elevation wetlands.	Population size and trend unknown.	In Utah species is found in Box Elder, Cache, Rich, Wasatch, Summit, Sevier, Piute, Wayne, Garfield and Kane Counties.
<b>General Threats</b>	<b>Specific Threats</b>	<b>General Conservation Actions</b>	<b>Specific Conservation Actions</b>	<b>Priority</b>
Human Disturbance	Off-highway vehicle recreation and improper grazing	Population Monitoring and Research	Monitor populations' responses to threats; provide habitat protection, if needed	H
Disease	Chytrid reducing survivorship	Test and Monitor Disease	Monitor extent of chytrid and measure survival; submit any additional potential samples for testing. Restrict transfers from infected populations	H
Invasive Animal Species	Predation by and competition with bullfrogs	Population Monitoring and Research	Monitor productivity and survival where bullfrogs are present; initiate mechanical control if needed	M

<b>Zebra-tailed Lizard</b>		<b>Biology and Life History</b>	<b>Population</b>	<b>Distribution</b>
<i>Callisaurus draconoides</i> Tier II Reptile		Occurs in fine windblown sand to firm soil habitats with little vegetation.	Population size and trends unknown.	southern and western parts of Washington County
<b>General Threats</b>	<b>Specific Threats</b>	<b>General Conservation Actions</b>	<b>Specific Conservation Actions</b>	<b>Priority</b>
Human Disturbance	Recreation	Protect Significant Areas	Prioritize and protect undisturbed areas with fencing or other restrictions	H
Development	Vegetation changes due to construction	Control and Monitor Disturbance	Monitor population response to habitat changes; reclaim habitats or provide alternatives, if needed	M
Lack of Information	Population status and trends unknown	Population Monitoring and Research	Determine population status and trends	M

## Birds

<b>Abert's Towhee</b> <i>Pipilo aberti</i> Tier III Bird		<b>Biology and Life History</b>	<b>Population</b>	<b>Distribution</b>
		Permanent resident in lowland riparian of southwestern Utah; pairs occupy territories year around.	Population trends for Abert's Towhee are not adequately measured by Breeding Bird Survey (Sauer et al. 2005) or other current monitoring programs in Utah. Uncommon in Utah.	Southwestern North America. In Utah, species occurs along the Virgin River drainage and Santa Clara River drainage.
<b>General Threats</b>	<b>Specific Threats</b>	<b>General Conservation Actions</b>	<b>Specific Conservation Actions</b>	<b>Priority</b>
Development	Overgrazing in riparian areas	Implement Existing Conservation Plan (Utah Avian Conservation Strategy [UTACS], i.e., Parrish et al. 2002)	Manage grazing practices to promote growth of native riparian vegetation and reduce grazing impacts during nesting season	H
Parasitism	Relatively high rate of nest parasitism by Brown-headed cowbirds	Implement Existing Conservation Plan (UTACS)	Monitor nest parasitism, potentially control Brown-headed cowbirds through trapping and distribution of cattle	M
Habitat Loss	Loss of riparian habitats from urban encroachment, tamarisk invasion and several other factors	Implement Existing Conservation Plan (UTACS)	Maintain and increase multi-layered riparian areas and replace tamarisk with native riparian vegetation; Conserve all suitable occupied habitat	H
Lack of Information	Population trends are poorly monitored	Population Monitoring and Research	Determine adequacy of existing monitoring techniques; develop species specific monitoring tools	H

<b>American Avocet</b> <i>Recurvirostra americana</i> Tier III Bird		<b>Biology and Life History</b>	<b>Population</b>	<b>Distribution</b>
		Nesting occurs in salt ponds or shallow alkaline wetlands. The Intermountain West region is the most important breeding area for American Avocets in North America (UTACS 2001).	The five-year mean peak count of avocets on Great Salt Lake is 122,000 and the largest amount in five years was 205,000 (Paul and Manning 2002). This represents nearly half of the estimated global population. This species is common in Utah.	Occurs near rivers and lakes in Box Elder, Uintah, Rich, Juab, Millard, Tooele and Grand Counties.
<b>General Threats</b>	<b>Specific Threats</b>	<b>General Conservation Actions</b>	<b>Specific Conservation Actions</b>	<b>Priority</b>
Limited Distribution	Intermountain West is the most important breeding area in North America	Implement Existing Conservation Plan (UTACS, Intermountain West Regional Shorebird Plan [IWRSP])	Establish and maintain important habitats for American avocets in Great Salt Lake, Utah Lake and Cutler Marsh areas; Monitor and assess population status in Great Basin and along migration routes	H
Lack of Information	Need further information on population status, productivity, and suspected declines	Population Monitoring and Research	Monitor survivorship, determine techniques to increase productivity, determine population status	M
Environmental Contaminant	Contamination of wetlands from agricultural practices, specifically selenium pollution associated with irrigation practices (Robinson et al. 1997)	Implement Existing Conservation Plan (IWSRP)	Regulate discharges and require mitigation for contaminated habitats; work with USFWS to monitor contaminants on Great Salt Lake	L
Human Disturbance	Off-road vehicle use	Implement Existing Conservation Plan (UTACS)	Restrict off-road vehicle use in important nesting and foraging habitats	L
Development	Destruction of shoreline habitat due to diking, road construction, and salt plant operations	Implement Existing Conservation Plan (UTACS)	Develop local and regional conservation plans with stakeholders	M
Water Development	Deterioration and loss of wetlands due to agricultural diversions, urban water storage, and flood control	Control and Monitor Disturbance	Monitor Great Salt Lake levels and correlate with population size and productivity	M

<b>American White Pelican</b> <i>Pelecanus erythrorhynchos</i> Tier II Bird		<b>Biology and Life History</b>	<b>Population</b>	<b>Distribution</b>	
		Pelicans nest colonially on islands. Great Salt Lake nesting colony is at great distance from food sources.	Locally common in the state and the Great Salt Lake colony is only major colony with 30 year positive trend. Lake fluctuations affect colony size.	In Utah, nests predominantly on Gunnison Island in the Great Salt Lake. That colony one of three largest in North America.	
<b>General Threats</b>	<b>Specific Threats</b>	<b>General Conservation Actions</b>	<b>Specific Conservation Actions</b>	<b>Priority</b>	
Human Disturbance	Human disturbance during breeding may result in abandonment of entire colony	Implement Existing Conservation Plan (UTACS, Western Regional Waterbird Plan [WRWP])	Human disturbance to breeding colony should be carefully managed to avoid abandonment and mortality	H	
High Percent of Global Population	Colony is one of three largest breeding colonies in North America	Implement Existing Conservation Plan (UTACS, WRWP)	Continue to monitor population, productivity and survival of Great Salt Lake population	H	
Limited Breeding Distribution	Limited breeding distribution increases threat of extinction/extirpation	Determine and Map Distribution	Conduct distribution surveys across West including nesting, foraging, and migrating habitats; determine habitat requirements and assess suitability of Great Salt Lake islands as pelican habitat.	M	
Disease	West Nile Virus could impact nesting colony	Test and Monitor Disease	Monitor colony for dead birds and test dead pelicans from colony and across northern Utah	M	

<b>Bald Eagle</b> <i>Haliaeetus leucocephalus</i> Tier I Bird		<b>Biology and Life History</b>	<b>Population</b>	<b>Distribution</b>	
		Matures at 4 -6 years old; life span around 30 years (USFWS 1983).	Bald Eagles have increased in number and expanded since the ban of DDT; the species has been downlisted from Endangered to Threatened as a result (USFWS 1995a). Bald Eagles winter in the thousands in Utah, but the nesting population (6 active nests in 2005) has not reached the recovery goal of 10.	Bald Eagles nest across the United States and Canada; eagles winter across the U.S. but are most abundant in the West and Midwest (USFWS 1983). In Utah, birds winter along open water bodies and rivers, in canyons along the Wasatch front and in groves of large trees in the west desert. Nesting in Utah is limited to single sites near Salt Lake City, Manila, Duchesne and Castle Dale; 2 sites occur near Westwater.	
<b>General Threats</b>	<b>Specific Threats</b>	<b>General Conservation Actions</b>	<b>Specific Conservation Actions</b>	<b>Priority</b>	
Habitat Loss	Loss of lowland riparian habitats which serve as both nest and roost habitat	Implement Existing Conservation Plan (Northern States Bald Eagle Recovery Plan[NSBERP])	Develop and implement nest management plans for all active nests; provide artificial nests where natural nests are threatened; protect known winter roosts	M	
Habitat Loss	Loss of lowland riparian habitats which serve as both nest and roost habitat	Implement Existing Conservation Plan (NSBERP)	Implement riparian restoration in areas near existing nest and roost sites	H	
Human Disturbance	Nest and roost abandonment for excessive human disturbance	Control and Monitor Disturbance	Provide seasonal and spatial buffers; regulate activities likely to cause site abandonment	M	

<b>Band-tailed Pigeon</b>		<b>Biology and Life History</b>	<b>Population</b>	<b>Distribution</b>
<i>Columba fasciata</i> Tier III Bird		Inhabits montane conifer or oak-pine forests. Peak nesting occurs from early to midsummer. A single egg is usually laid in the nest and is incubated by both parents.	Breeding population has declined since the 1960's (Audobon 2002). Breeding Bird Survey trend analysis shows a significant decline across its U.S. and Western range of 2.0% per year from 1966-2004 (Sauer et al. 2005). This species is uncommon in Utah.	Found along coastal woodlands of the Pacific coast as well as the mountains of Colorado, New Mexico, Arizona and Utah.  In Utah, this species nests at mid-elevations in mountain habitat and is more common in the southern part of the state.
<b>General Threats</b>	<b>Specific Threats</b>	<b>General Conservation Actions</b>	<b>Specific Conservation Actions</b>	<b>Priority</b>
Lack of Information	Lack of information on absolute or relative abundance and demographics of Band-tailed Pigeons	Population Monitoring and Research	Test monitoring techniques; monitor range-wide population size; assess annual production; estimate survival rates; determine age-specific recruitment; determine impacts of non-hunting mortality	M
Habitat Loss	Degradation of suitable habitat	Habitat Monitoring and Research	Determine impacts of Ponderosa Pine habitat loss and alteration on species; Identify the distribution, types, and use of habitats	M
Harvest	Unregulated hunting in portions of range	Education and Outreach	Develop annual hunting regulations across range; assess various harvest options; evaluate effects of early-season harvest	M
Lack of Information	Information is lacking on the present distribution	Implement Existing Conservation Plans (Pacific and Central Flyway, Four Corners Population and UDWR Pigeon Management Plans)	Determine present population range, develop current distribution maps	M

<b>Bell's Vireo</b>		<b>Biology and Life History</b>	<b>Population</b>	<b>Distribution</b>
<i>Vireo bellii</i> Tier III Bird		Neotropical migrant that requires dense shrubby riparian areas in which to nest.	Species shows a significant (2.9% annual) decline across it's range (Sauer et al. 2005). Bell's Vireo is rare in Utah.	Four subspecies occur in North America; the Arizona Bell's Vireo occurs in Washington and Kane Counties of Utah in the Beaver Dam Wash and Virgin River drainages.
<b>General Threats</b>	<b>Specific Threats</b>	<b>General Conservation Actions</b>	<b>Specific Conservation Actions</b>	<b>Priority</b>
Habitat Loss	Loss, fragmentation and degradation of riparian habitats from various factors; particularly removal of shrub layer	Implement Existing Conservation Plan (UTACS)	Protect and restore multi-layered riparian habitats in southwestern Utah; replace tamarisk with native vegetation; manage grazing to promote growth of riparian shrubs and enhance vireo nesting	H
Nest Parasitism	Brown-headed Cowbird parasitism is a serious problem throughout the range	Implement Existing Conservation Plan (UTACS)	Manage cowbirds through removal and distribution of livestock (e.g., feedlots, stables, dairies, salt licks); study impacts of cowbird parasitism on vireo productivity	M
Lack of Information	Arizona Bell's Vireo subspecies poorly studied	Population Monitoring and Research	Determine population demographics and habitat needs for subspecies	M

<b>Bendire's Thrasher</b> <i>Toxostoma bendirei</i> Tier III Bird		<b>Biology and Life History</b>	<b>Population</b>	<b>Distribution</b>
		Breeds in desert habitats, primarily in areas with tall open vegetation, cholla cactus, Joshua trees, and yucca, and adjacent juniper woodland, locally in agricultural areas with adjacent scrub and arid grassland with scattered bushes and yuccas (American Ornithologist's Union 1998).	The Breeding Bird Survey indicates significant population declines of over 5% per year since 1966 in both the Western Region and Surveywide (Sauer et al. 2005), though these estimates may be imprecise due to low occurrence on survey routes. Rich et al. (2004) has designated the Bendire's Thrasher as a Watch List Species due to its low population size and declining population trend.	Distribution is limited to the deserts of California, Nevada, Utah, Arizona, New Mexico and northern Mexico. In Utah, this species occurs only in the southwestern corner of the state.
<b>General Threats</b>	<b>Specific Threats</b>	<b>General Conservation Actions</b>	<b>Specific Conservation Actions</b>	<b>Priority</b>
Limited Distribution	Rangewide limited to deserts of southwestern U.S. and northern Mexico; limited to Mojave desert of southwestern Utah	Determine and Map Distribution	Survey suitable habitat in Utah to determine extent of distribution	M
Lack of Information	Poor estimates of population size and population trends	Population Monitoring and Research	Determine current population status and productivity in Utah; determine effectiveness of current monitoring methods; develop species specific monitoring tools	M
Habitat Loss	Fragmentation of large patches of shrubland from development such as urbanization, pipelines and roads	Restore Degraded Habitats	Restore desert shrublands to create large contiguous patches	M
Habitat Loss	Fragmentation of large patches of shrubland from development such as urbanization, pipelines and roads	Conserve Suitable Habitats	Retain large patches of desert shrubland in southwestern Utah	H

<b>Black Rosy-finch</b> <i>Leucosticte atrata</i> Tier III Bird		<b>Biology and Life History</b>	<b>Population</b>	<b>Distribution</b>
		Altitudinal migrant which nests in the alpine tundra and winters in low elevation valleys.	Very little is known of population trends or demographics. Species is uncommon in Utah.	Utah is a significant portion of the Black Rosy-finch range. Species nests in Uinta and Wasatch Mountains south to the Tushar Range; species also occurs in Deep Creek and La Sal Mountains.
<b>General Threats</b>	<b>Specific Threats</b>	<b>General Conservation Actions</b>	<b>Specific Conservation Actions</b>	<b>Priority</b>
Limited Distribution	Species occurs in isolated populations at highest elevations of Utah mountain ranges	Determine and Map Distribution	Inventory Rosy-finch locations across state in summer and winter	M
Lack of Information	Very limited information on populations, demographics, or breeding habitat needs	Population Monitoring and Research	Determine densities of breeding populations and monitor periodically	M
Lack of Information	Little information available regarding winter roost areas	Implement Existing Conservation Plan (UTACS)	Determine roost site characteristics, particularly use of abandoned mines and artificial structures	M

<b>Black Swift</b> <i>Cypseloides niger</i> Tier II Bird		<b>Biology and Life History</b>	<b>Population</b>	<b>Distribution</b>
		Only nests near waterfalls. Lays only one egg. Extended incubation and nestling periods; nearly 80 days from laying to fledging.	The rangewide population appears to be declining (7.0% per year, P= 0.12) (Sauer et al. 2005). Very rare in Utah, since 1960 only 2 known general nesting areas in state.	Nests in Provo Canyon, Utah County, and the Mount Timpanogos area of Zion National Park.
<b>General Threats</b>	<b>Specific Threats</b>	<b>General Conservation Actions</b>	<b>Specific Conservation Actions</b>	<b>Priority</b>
Lack of Information	Need further information on distribution & habitat requirements	Implement Existing Conservation Plan (UTACS)	Survey waterfalls throughout the state to determine occupation	H
Limited Distribution	Highly specialized nesting habitat results in very limited distribution in Utah and increased risk of extirpation	Implement Existing Conservation Plan (UTACS)	Protect known nesting sites (including water flow/quality)	H
Human Disturbance	Recreation such as hiking to and around falls may impact nesting	Implement Existing Conservation Plan (UTACS)	Determine effect of recreation, reduce/control habitat alteration (including water flow/quality)	M
Water Development	Water reallocation potentially threatens this species	Implement Existing Conservation Plan (UTACS)	Maintain flows and water quality at currently and historically occupied nest sites	H

<b>Black-billed Cuckoo</b> <i>Coccyzus erythrophthalmus</i> Tier III Bird		<b>Biology and Life History</b>	<b>Population</b>	<b>Distribution</b>
		Found in moist thickets, low overgrown pastures, and orchards; also occurs in thicker undergrowth and sparse woodlands.	No trend estimates are available for this species in the state of Utah. Rare in Utah, only six records in the state.	The Black-billed Cuckoo is a rare summer resident in north-central Utah. There is some evidence to suggest that some of these birds may be breeding in Utah. Further research would be required to substantiate reports. Six existing records are from the Salt Lake area.
<b>General Threats</b>	<b>Specific Threats</b>	<b>General Conservation Actions</b>	<b>Specific Conservation Actions</b>	<b>Priority</b>
Habitat Loss	Destruction or degradation of riparian habitat	Restore Degraded Habitats	Protect existing riparian habitats along Wasatch Front; restore riparian where possible	H
Lack of Information	Little data on occurrence and status in Utah	Population Monitoring and Research	Initiate inventory efforts at historical sites and sites with suitable habitat	L

<b>Black-necked Stilt</b> <i>Himantopus mexicanus</i> Tier III Bird		<b>Biology and Life History</b>	<b>Population</b>	<b>Distribution</b>	
		Nests colonially on mudflats and shorelines. The Intermountain West region is the most important breeding area for Black-necked Stilts in North American (UTACS 2001).	Uncommon in Utah, current trend is unknown. Five-year average peak counts of this species on Great Salt Lake were 38,000 with a max count of 57,000 (Paul and Manning 2002).	Breeds in western and west-central states, Gulf and Atlantic coasts, Baja California, western Mexico, southwest-central Canada, and portions of the Bahamas and West Indies. Summer resident in northern Utah.	
<b>General Threats</b>	<b>Specific Threats</b>	<b>General Conservation Actions</b>		<b>Specific Conservation Actions</b>	<b>Priority</b>
Limited Distribution	Intermountain West Region is the most important breeding area for Black-necked Stilts	Implement Existing Conservation Plan (UTACS, IWRSP)		Monitor and assess population status in Great Basin and along migration routes	H
Lack of Information	Need further information on population status, productivity, and suspected declines	Population Monitoring and Research		Monitor survivorship, determine techniques to increase productivity, determine population status	M
Environmental Contaminant	Contamination of wetlands from agricultural practices, specifically selenium pollution associated with irrigation practices (Robinson et al. 1997)	Implement Existing Conservation Plan (IWRSP)		Regulate discharges and require mitigation for contaminated habitats; work with USFWS to monitor contaminants in Great Salt Lake	L
Human Disturbance	Off-road vehicle use	Implement Existing Conservation Plan (UTACS)		Sign nest colonies and access points	L
Development	Destruction of shoreline habitat due to diking, road construction, and salt plant operations	Implement Existing Conservation Plan (UTACS)		Develop local and regional conservation plans with stakeholders	M
Water Development	Deterioration and loss of wetlands due to agricultural diversions, urban water storage, and flood control	Control and Monitor Disturbance		Monitor Great Salt Lake levels and correlate with population size and productivity	M

<b>Black-throated Gray Warbler</b> <i>Dendroica nigrescens</i> Tier III Bird		<b>Biology and Life History</b>	<b>Population</b>	<b>Distribution</b>	
		Single brood species. Preferred breeding habitat is pinyon-juniper woodlands.	Uncommon in Utah. BBS data indicated that the species population appears to be stable (Sauer et al. 2005).	Breeding range almost entirely within western United States. Species occurs throughout Utah.	
<b>General Threats</b>	<b>Specific Threats</b>	<b>General Conservation Actions</b>		<b>Specific Conservation Actions</b>	<b>Priority</b>
Lack of Information	Information lacking on population, life history, and habitat requirements	Population Monitoring and Research		Determine current population status, trend, and breeding status in Utah	L
Lack of Information	Information lacking on response to habitat change	Habitat Monitoring and Research		Determine response to habitat alteration including timber harvest, fire management, livestock grazing	L
Habitat Loss	Destruction of preferred habitats due to chaining, timber harvest, fire management, and livestock grazing	Implement Existing Conservation Plan (UTACS)		Survey areas prior to treatment; discourage large clearings of suitable habitat, encourage small openings and retain large trees	M
Habitat Loss	Destruction of preferred habitats due to chaining, timber harvest, fire management, and livestock grazing	Education and Outreach		Prepare Pinyon-Juniper Bird Management Manual in cooperation with adjacent states and federal agencies	H

<b>Bobolink</b> <i>Dolichonyx oryzivorus</i> Tier II Bird		<b>Biology and Life History</b>	<b>Population</b>	<b>Distribution</b>
		Wet meadow obligate. One of the longest migrations of North American passerines. Uncommon cowbird host.	Significant (1.7% per year) population decline across range (Sauer et al. 2005). Historically common in northern Utah, now rare.	Isolated breeding populations in northern Utah and West.
<b>General Threats</b>	<b>Specific Threats</b>	<b>General Conservation Actions</b>	<b>Specific Conservation Actions</b>	<b>Priority</b>
Development	Nest and young survival reduced by mowing during nesting period	Implement Existing Conservation Plan (UTACS)	Manage mowing in cooperation with landowners to avoid impacting nesting and fledgling birds	H
Limited Distribution	Distribution of species has been drastically reduced from historical distribution	Implement Existing Conservation Plan (UTACS)	Educate landowners on effects of mowing	H
Habitat Loss	Wet meadow habitats have decreased and been fragmented by agricultural and urban encroachment, road development, water development (reservoirs and instream flow depletions) and stream channelization	Implement Existing Conservation Plan (UTACS)	Determine effect of mowing and grazing on breeding birds	H
Habitat Loss	Habitat decline and fragmentation	Implement Existing Conservation Plan (UTACS)	Maintain wet meadows with breeding Bobolink populations	H
Habitat Loss	Habitat decline and fragmentation	Implement Existing Conservation Plan (UTACS)	Create habitats to connect existing populations	H

<b>Boreal Owl</b> <i>Aegolius funereus</i> Tier III Bird		<b>Biology and Life History</b>	<b>Population</b>	<b>Distribution</b>
		Occurs in northern coniferous and mixed deciduous boreal and sub-alpine forests of North America.	Global population appears reasonably secure, whereas in the southernmost portions of its range localized populations may be more susceptible to extirpation. Rare in Utah.	Widely distributed throughout Canada and Eurasia. More localized populations extend farther south into North America including Colorado, Utah, Wyoming, Montana, Idaho and Washington. In Utah, species occurs in the central Wasatch region.
<b>General Threats</b>	<b>Specific Threats</b>	<b>General Conservation Actions</b>	<b>Specific Conservation Actions</b>	<b>Priority</b>
Lack of Information	Information needed on distribution and breeding status in Utah	Population Monitoring and Research	Monitoring needed to determine current distribution and breeding status in Utah	L
Environmental Contaminant	Sensitive to use of pesticides in forest environments	Control and Monitor Contaminants	Avoid use of detrimental pesticides in known breeding locations	L
Habitat Loss	Loss of suitable nesting cavities from removal of old snags	Habitat Monitoring and Research	Determine density of snags required for successful breeding and population maintenance	L

<b>Brewer's Sparrow</b> <i>Spizella breweri</i> Tier III Bird		<b>Biology and Life History</b>	<b>Population</b>	<b>Distribution</b>
		Considered shrubsteppe obligates (Braun et al. 1976).	Declining rangewide at 3.7% per year (Sauer et al. 2005). Common and stable in Utah and population and may act as a source for other populations in the West.	Primarily a Great Basin species but occurs in shrubsteppe in all western states (Parrish et al. 2002). Breeds throughout Utah in lowland areas.
<b>General Threats</b>	<b>Specific Threats</b>	<b>General Conservation Actions</b>	<b>Specific Conservation Actions</b>	<b>Priority</b>
High Percent of Global Population	Utah is an important area to this species	Implement Existing Conservation Plan (UTACS)	Monitor population status, trend, and survivorship in Utah	H
Nest Parasitism	Parasitism by Brown-headed Cowbirds varies greatly but in some areas exceeds 50% of nests parasitized	Inventory and Monitor Invasive Species	Determine impact of parasitism on Utah population; control cowbirds when necessary	M
Lack of Information	Information lacking on habitat requirements and response to alteration	Implement Existing Conservation Plan (UTACS)	Determine habitat requirements and ecological interactions	H
Habitat Loss	Degradation and destruction of shrubsteppe habitats due to fire, introduction of non-native grasses, and urban encroachment	Implement Existing Conservation Plan (UTACS)	Monitor response to habitat alteration as part of shrubsteppe monitoring program	H



<b>Broad-tailed Hummingbird</b>		<b>Biology and Life History</b>	<b>Population</b>	<b>Distribution</b>
<i>Selasphorus platycercus</i> Tier III Bird		Dependent on nectar-bearing flowering plants. Females will abandon nesting attempt if resources decline substantially.	BBS data indicate a stable population trend (Sauer et al. 2005); Utah point count data (1992-2001) indicates significant declining trend throughout Utah (Norvell et al. 2003). Common in Utah.	Eastern Guatemala north through Mexico, western United States north to southwestern Montana. Occurs statewide in Utah.
<b>General Threats</b>	<b>Specific Threats</b>	<b>General Conservation Actions</b>		<b>Specific Conservation Actions</b> <span style="float: right;">Priority</span>
Lack of Information	Additional information needed on population declines and response to habitat alteration	Implement Existing Conservation Plan (UTACS)	Determine effectiveness of population monitoring techniques and response to habitat alteration	M
Habitat Loss	Alteration/ degradation of mountain riparian and lowland riparian habitats and removal of nectar-bearing flowering plants	Habitat Monitoring and Research	Determine factors impacting suitable habitats and nectar-bearing flowers	M

<b>Burrowing Owl</b>		<b>Biology and Life History</b>	<b>Population</b>	<b>Distribution</b>
<i>Athene cunicularia</i> Tier II Bird		Burrow nester usually relying on other animals to make burrows.	Rangewide non-significant population decline (2.3% per year) but western population significantly increasing (4.5% per year) (Sauer et al. 2005). Rare in Utah.	Historically more extensive in Utah. Occurs statewide in shrubsteppe habitat.
<b>General Threats</b>	<b>Specific Threats</b>	<b>General Conservation Actions</b>		<b>Specific Conservation Actions</b> <span style="float: right;">Priority</span>
Development	Urbanization destroying nesting habitat	Population Monitoring and Research	Determine response to habitat alteration, human disturbance, and prairie dog control	H
Lack of Information	Further information is needed on population, productivity and relationship to prairie dog colonies	Population Monitoring and Research	Monitor population, productivity, and survival	H
Lack of Information	Further information is needed on genetic distribution	Population Monitoring and Research	Determine genetic relationship among Utah populations and other population across the range	M

<b>California Condor</b>		<b>Biology and Life History</b>	<b>Population</b>	<b>Distribution</b>
<i>Gymnogyps californianus</i> Tier I Bird		Condors are large scavengers requiring extensive areas in which to forage. Birds mature at age 5-8 years (USFWS 1996). Because of extended parental care, some condor pairs may not breed every year.	As of May 2005, the condor population was 256 individuals, including 142 in the captive flock and 114 in the wild. (CDFG 2005). The northern Arizona population has 52 birds.	There are 4 wild populations (southern California, central California, Baja California and northern Arizona) and a captive population (spread among 4 western facilities) (CDFG 2005). Birds from the northern Arizona population frequently forage and roost in Utah and are likely to nest in southern Utah.
<b>General Threats</b>	<b>Specific Threats</b>	<b>General Conservation Actions</b>		<b>Specific Conservation Actions</b> <span style="float: right;">Priority</span>
Limited Distribution	Loss of significant portion of entire population from stochastic events (such as weather) and genetic founder effects (such as inbreeding)	Implement Existing Conservation Plan (California Condor Recovery Plan (CCRP))	Release condors into suitable habitats	H
Limited Habitat	Inadequate protection of suitable nesting sites	Implement Existing Conservation Plan (CCRP)	Protect known nesting sites; preserve key foraging areas near nesting sites	H
Environmental Contamination	Loss of individual birds from contaminants such as lead and antifreeze	Implement Existing Conservation Plan (CCRP)	Determine effects of various poisons and contaminants; sample potential food items; regulate use of metals and other contaminants	H

<b>Caspian Tern</b> <i>Sterna caspia</i> Tier III Bird		<b>Biology and Life History</b>	<b>Population</b>	<b>Distribution</b>
		Least gregarious of the terns. May nest singly or in colonies. Nests are located on the ground often on islands or dikes. Feed almost exclusively on small fish.	In the early 1900's, populations were drastically reduced. This species is recovering, but population changes are highly localized. Five year average peak count on Great Salt Lake was 250, maximum 500 (Paul and Manning 2002). Rare in Utah but breeding population appears to be stable.	Breeds locally in eastern Oregon, northwestern Wyoming, Idaho (recent range expansion), and North Dakota, south to southern California, western Nevada and northern Mexico. In Utah, breeds in northern part of state. Also breeds in coastal Washington and California.
<b>General Threats</b>	<b>Specific Threats</b>	<b>General Conservation Actions</b>	<b>Specific Conservation Actions</b>	<b>Priority</b>
Lack of Information	Information needed on population and productivity	Population Monitoring and Research	Determine current population status and productivity in Utah	M
Lack of Information	Information needed on habitat and prey requirements	Habitat Monitoring and Research	Determine prey and habitat requirements and response to habitat alteration	M
Habitat Loss	Loss of interior wetlands and suitable breeding areas	Protect Significant Areas	Protect breeding colonies through water management	H
Human Disturbance	Disturbance at nest sites and egg collection	Education and Outreach	Educate public on sensitivity of colonial nesting species	M
Environmental Contaminant	Bioaccumulation of chemicals	Control and Monitor Contaminants	Coordinate with USFWS on contaminant evaluation	L
Human Disturbance	Removal of nesting colonies and killing of birds due to perceived conflict with fisheries	Education and Outreach	Educate public and private fisheries managers on effective bird deterrent techniques	M

<b>Crissal Thrasher</b> <i>Toxostoma crissale</i> Tier III Bird		<b>Biology and Life History</b>	<b>Population</b>	<b>Distribution</b>
		Nests in dense mesquite and streamside shrubs in the Virgin River and its tributaries.	Species uncommon in Utah; current methods, such as BBS, do not adequately monitor Crissal Thrasher populations (Sauer et al. 2005).	Permanent resident of Southwestern Utah.
<b>General Threats</b>	<b>Specific Threats</b>	<b>General Conservation Actions</b>	<b>Specific Conservation Actions</b>	<b>Priority</b>
Lack of Information	Information needed on population and productivity	Population Monitoring and Research	Determine current population status and productivity in Utah	M
Human Disturbance	Human disturbance from urban encroachment and recreation	Control and Monitor Disturbance	Determine response to habitat alteration and disturbance from recreation	M
Habitat Loss	Riparian habitat adversely affected by agriculture, urban encroachment and other riparian impactors	Conserve Suitable Habitat	Protect and restore riparian habitats in southwestern Utah	H

<b>Ferruginous Hawk</b>		<b>Biology and Life History</b>	<b>Population</b>	<b>Distribution</b>
<i>Buteo regalis</i> Tier II Bird		Nests in ecotone between pinyon-juniper and shrubsteppe habitats.	Rare in Utah, productivity may not be sufficient to maintain state's population (UDWR unpublished data).	Summer resident in lowland desert terrain throughout Utah.
<b>General Threats</b>	<b>Specific Threats</b>	<b>General Conservation Actions</b>	<b>Specific Conservation Actions</b>	<b>Priority</b>
Human Disturbance	Species is prone to abandon nest sites with even low level of human disturbance	Control and Monitor Disturbance	Manage and/or mitigate disturbance from recreation near nest sites	H
Lack of Information	Need further information on population status and productivity	Population Monitoring and Research	Conduct surveys on population, productivity and distribution	H
Habitat Loss	Nest site reduction from removal of natural nesting areas	Implement Existing Conservation Plan (UTACS)	Discourage clearing of juniper woodlands; Determine importance of alternate nests; Augment nest availability with artificial nests where appropriate. Avoid impact to nesting sites during habitat management activities	H
Energy Development	Loss of habitat and disturbance on breeding grounds from oil and gas extration activities	Implement Existing Conservation Plan (UTACS)	Establish buffer zones around nests; Determine effects of oil and gas activities on nesting and foraging	H
Habitat Loss	Destruction of preferred habitats due to chaining, timber harvest, fire management, and livestock grazing	Education and Outreach	Prepare Pinyon-Juniper Bird Management Manual in cooperation with adjacent states and federal agencies	H

<b>Gambel's Quail</b>		<b>Biology and Life History</b>	<b>Population</b>	<b>Distribution</b>
<i>Callipepla gambelii</i> Tier III Bird		Permanent resident throughout its range. Primary food sources include seeds of forbs, grasses, shrubs and cacti. There is a strong correlation between breeding success and winter-spring precipitation in desert areas.	Uncommon in Utah but population trends unknown.	Permanent resident of Southwestern United States and Sonora, Mexico. In Utah, Gambel's Quail are found in Washington Co., Kane Co., and along the Colorado River in Grand Co.
<b>General Threats</b>	<b>Specific Threats</b>	<b>General Conservation Actions</b>	<b>Specific Conservation Actions</b>	<b>Priority</b>
Development	Impacts to quail habitats from urbanization and improper grazing	Implement Existing Conservation Plan (UTACS)	Monitor population responses to grazing; manage grazing to promote native vegetation; discourage clearing of riparian area; identify and enhance fragmented and degraded habitats	H
Invasive Plant Species	Exotic weed infestation of habitats and related alteration of natural fire regime	Implement Existing Conservation Plan (UDWR Strategic Plan for Gambel's Quail)	Identify and protect existing habitat; Monitor population response to fire	M
Development	Suitable habitat removed through clearing of fence rows and field edges	Implement Existing Conservation Plan (UTACS)	Establish fence row and roadside habitat program	M

<b>Grasshopper Sparrow</b>		<b>Biology and Life History</b>	<b>Population</b>	<b>Distribution</b>
<i>Ammodramus savannarum</i> Tier II Bird		Nests in native or restored grasslands.	Rare in Utah, species experiencing significant rangewide (3.8% per year) and western (6.9% per year) declines (Sauer et al. 2005).	Limited to northern portion of Utah in grassland areas.
<b>General Threats</b>	<b>Specific Threats</b>	<b>General Conservation Actions</b>	<b>Specific Conservation Actions</b>	<b>Priority</b>
Lack of Information	Unknown population status and distribution	Population Monitoring and Research	Determine extent of distribution and population status in Utah	H
Habitat Loss	Historical grassland conversion to croplands	Population Monitoring and Research	Determine response to Conservation Reserve Program	H
Habitat Loss	Species appears to nest only in ungrazed grasslands	Population Monitoring and Research	Determine effect of grazing on breeding birds	H

<b>Gray Vireo</b>		<b>Biology and Life History</b>	<b>Population</b>	<b>Distribution</b>
<i>Vireo vicinior</i> Tier III Bird		Short-distance migrant. (Breeding populations do not entirely depart from U.S.)	Highest densities within the Colorado Plateau, but species is considered rare in Utah. Long-term declines have been noted in California and Arizona (Desante and George 1994, Small 1994).	Breeds on arid slopes dominated by mature Pinyon-Juniper or juniper woodlands of southwestern Utah, as far north as Sevier County (Woodbury and Cottam 1962).
<b>General Threats</b>	<b>Specific Threats</b>	<b>General Conservation Actions</b>	<b>Specific Conservation Actions</b>	<b>Priority</b>
High Percent of Global Population	Highest densities of Gray Vireos are within the Colorado Plateau with Utah containing the bulk of the distribution.	Implement Existing Conservation Plan (UTACS, Continental Partners in Flight Plan [CPIFP])	Determine population status, life history and population dynamics, monitor population trends	M
Lack of Information	Information needed on Utah distribution, ecology, and life history requirements	Implement Existing Conservation Plan (UTACS)	Determine current Utah distribution, ecology, and life history requirements	M
Nest Parasitism	Nest parasitism by Brown-headed Cowbirds	Control and Monitor Invasive Species	Monitor cowbird parasitism and control if warranted	L
Habitat Loss	Degradation of pinyon-juniper habitats due to overgrazing, fuel harvest, and introduction of exotic annuals.	Implement Existing Conservation Plan (UTACS)	Survey for vireos prior to management activities; correlate treatment effects with occurrence and other variables	M
Habitat Loss	Degradation of pinyon-juniper habitats due to overgrazing, fuel harvest, and introduction of exotic annuals.	Implement Existing Conservation Plan (UTACS)	Prepare Pinyon-Juniper Bird Management Manual in cooperation with adjacent states and federal agencies	H
Human Disturbance	Habitat degradation due to recreational vehicle use	Education and Outreach	Increase cooperation with federal agencies to enforce existing regulations	M

<b>Greater Sage-grouse</b> <i>Centrocercus urophasianus</i> Tier II Bird		<b>Biology and Life History</b>	<b>Population</b>	<b>Distribution</b>	
		Ground nester in sagebrush habitat and is susceptible to native and non-native predation. Recovery from population declines is hindered by small clutch size.	Dramatic population decline throughout range in the last 70 years, and number of males at lek sites continues to decrease (Connelly and Braun 1997). Utah populations have decreased by approximately 90% (Beck et al. 2003).	Current range includes western and northwestern states and parts of Canada. In Utah, they are found primarily in Box Elder, Uintah, Rich and Wayne Counties.	
<b>General Threats</b>	<b>Specific Threats</b>	<b>General Conservation Actions</b>	<b>Specific Conservation Actions</b>	<b>Priority</b>	
Disease	West Nile Virus	Implement Existing Conservation Plan (UTACS, DWR Sage-grouse Plan [DWRSGP])	Monitor and control disease	M	
Habitat Loss	Loss of shrubsteppe from improper grazing, invasive plants, disrupted fire regimes and other factors; lack of herbaceous under story in sagebrush habitats	Implement Existing Conservation Plan (UTACS, DWRSGP)	Establish local working groups who will complete local conservation plans	H	
Habitat Loss	Pinyon-Juniper succession in sagebrush habitats	Implement Existing Conservation Plan (UTACS, DWRSGP)	Identify and enhance fragmented and degraded habitats	H	
Development	Expansion by oil and gas industries	Implement Existing Conservation Plan (UTACS, DWRSGP)	Identify and protect existing habitat	H	
Limited Distribution	Species is restricted to portion of historic range	Implement Existing Conservation Plan (UTACS, DWRSGP, CPIFP)	Monitor population trends	H	
Invasive Animal Species	Predation by Red fox and Common Raven	Control and Monitor Invasive Species	Monitor and control predation	M	

Gunnison Sage-grouse <i>Centrocercus minimus</i> Tier I		Biology and Life History	Population	Distribution
Bird		Require a range of shrubsteppe habitat types for different life history components (breeding, nesting, brood rearing, wintering); food and cover requirements change throughout the year. Species depends on leks where males display and females select mates. This is a ground nesting species with a small clutch size and is susceptible to native and non-native predation.	An estimated 3,200 breeding birds occur in 7 populations, approximately 2,400 of which occur in the Gunnison Basin. The species has declined, though magnitude of decline is difficult to thoroughly assess. The Utah population is estimated at 100-120 birds (Gunnison Sage-grouse Rangewide Steering Committee 2005).	Gunnison sage-grouse occupy a small fraction of their historical range and have been extirpated from much of their presumed historical distribution in southwest Colorado, southeast Utah, northeast Arizona, and northern New Mexico. Distribution was probably always somewhat fragmented, but fragmentation has been greatly exacerbated by habitat loss (Gunnison Sage-grouse Rangewide Steering Committee 2005). In Utah distribution is limited to 5 leks in Monticello area of San Juan County.
General Threats	Specific Threats	General Conservation Actions	Specific Conservation Actions	Priority
Habitat Loss	Permanent loss, and associated fragmentation and degradation of sagebrush habitat associated with urban development and/or conversion	Implement Existing Conservation Plan (Gunnison Sage-grouse Rangewide Conservation Plan [GSRCP] and San Juan County Conservation Plan [SJCCP])	Reestablish appropriate breeding, brood rearing and wintering habitat as well as travel corridors through combinations of planting, seeding, water development, and sagebrush and pinyon-juniper treatments	H
Habitat Loss	Permanent loss and degradation of sage brush habitat particularly leks	Implement Existing Conservation Plan (SJCCP)	Enrole key habitats in Conservation Reserve Program develop conservation easements for leks and other key habitats	H
Limited Distribution	Low genetic diversity, genetic drift from small population sizes	Implement Existing Conservation Plan (SJCCP)	San Juan plan calls for 500 individuals attending 6-8 leks, with an average of 20-25 males/lek to be achieved through habitat management and population augmentation	H
Limited Distribution	Unnaturally high levels of predation	Implement Existing Conservation Plan (GSRCP)	Manage habitats to reduce predator interactions with sage-grouse	H

<b>Lewis's Woodpecker</b> <i>Melanerpes lewis</i> Tier II  Bird		<b>Biology and Life History</b>  Flycatching woodpecker found in open Ponderosa, Riparian and possibly aspen forests. Wanders in nomadic flocks in fall and winter.	<b>Population</b>  Lewis's woodpecker has been functionally extirpated from Wasatch front; species is much less common today than historically (Behle et al. 1985). Population trend estimates are inconclusive. Species is an uncommon permanent resident in Utah.	<b>Distribution</b>  Breeds from southern British Columbia to southwestern South Dakota and northwestern Nebraska to south central California, central Utah southern New Mexico and eastern Colorado (DeGraaf 1991). In Utah, distribution is concentrated in the northeastern and southeastern regions of the state with a small number occurring in the northwestern corner. Utah represents a significant portion of the species overall range (Parrish et al. 2002).	
<b>General Threats</b>	<b>Specific Threats</b>	<b>General Conservation Actions</b>	<b>Specific Conservation Actions</b>  Priority		
Habitat Loss	Fire suppression has decreased open forests needed for foraging	Implement Existing Conservation Plan (UTACS)	Cooperate with land management agencies to create open Ponderosa forests with large trees		H
Development	Overgrazing in riparian areas has removed ground cover required by insect prey	Implement Existing Conservation Plan (UTACS)	Manage grazing practices to maintain ground cover, especially in riparian areas		H
Invasive Animal Species	European Starlings are major competitors for nesting cavities	Population Monitoring and Research	Determine population effects of starling competition and investigate methods of reducing competition		M
Lack of Information	Limited information and methodologies regarding population trends and demographics	Population Monitoring and Research	Determine population and demographic trends; investigate monitoring methods		H
Lack of Information	Limited information on habitat needs	Habitat Monitoring and Research	Determine habitat characteristics in Ponderosa, Riparian and aspen forests		H

Long-billed Curlew		Biology and Life History	Population	Distribution	
<i>Numenius americanus</i> Tier II <div>Bird</div>		Ground nesters in rangeland and pastures and are vulnerable to predation and disturbance.	Decreasing rangewide at 1.6% per year (Sauer et al. 2005) with Utah populations substantially diminished over the last century.	Spotty distribution throughout the Great Basin. In Utah, it occurs most often in northern and central valleys.	
General Threats	Specific Threats	General Conservation Actions		Specific Conservation Actions	Priority
Human Disturbance	Human disturbance as a result of housing development and introduction of domestic pets	Implement Existing Conservation Plan (UTACS, IWRSP)		Use the GSL Waterbird Survey to monitor population status and productivity	H
Limited Distribution	Intermountain West is considered most important breeding area	Implement Existing Conservation Plan (UTACS, IWRSP)		Establish statewide inventory and monitoring program	H
Invasive Animal Species	Predation by red foxes introduced into breeding habitat	Implement Existing Conservation Plan (UTACS, IWRSP)		Evaluate productivity and survival in habitats with red foxes	M
Habitat Loss	Fragmentation of nesting habitat	Habitat Monitoring and Research		Determine minimum patch size requirements	M

<b>Lucy's Warbler</b>		<b>Biology and Life History</b>	<b>Population</b>	<b>Distribution</b>
<i>Vermivora luciae</i> Tier III Bird		Primary and secondary breeding habitats are lowland riparian. Nests in cavities and requires tree holes.	Common in Utah. BBS data shows no significant population trend, however sample size for this species is very small (Sauer et al. 2005).	Breeds in northern Mexico and southwestern deserts of United States. Occurs in riparian zones in southern Utah, especially the Virgin River Valley.
<b>General Threats</b>	<b>Specific Threats</b>	<b>General Conservation Actions</b>	<b>Specific Conservation Actions</b>	<b>Priority</b>
Lack of Information	Information needed on population status, habitat requirements, and response to habitat alteration	Implement Existing Conservation Plan (UTACS)	Determine current population status, habitat requirements, and response to habitat alteration	M
Nest Parasitism	High degree of parasitism by Brown-headed Cowbirds	Implement Existing Conservation Plan (UTACS)	Determine impact of cowbird parasitism on population; control cowbirds if necessary	M
Habitat Loss	Degradation of lowland riparian due to dewatering, livestock grazing, and urban encroachment	Implement Existing Conservation Plan (UTACS)	Evaluate effects of habitat loss on populations and demography	M
Habitat Loss	Degradation of lowland riparian due to dewatering, livestock grazing, and urban encroachment	Implement Existing Conservation Plan (UTACS)	Protect and restore riparian habitats in southern Utah	H

<b>Mexican Spotted Owl</b>		<b>Biology and Life History</b>	<b>Population</b>	<b>Distribution</b>
<i>Strix occidentalis lucida</i> Tier I Bird		Birds mature at age 3 with life expectancy around 15-20 years; pairs may forego breeding in years of low prey availability (USFWS 1995b).	Current population size and trend are unknown. The number of known owl nesting sites was 758 from 1990-1993 (USFWS 1995b).	Mexican Spotted Owls are distributed across the Southwest and into Mexico primarily in canyon and mixed conifer habitats. In Utah, owls occur most frequently in canyons and nest almost exclusively in caves; nest sites are concentrated in the areas of Zion N.P., Escalante National Monument, Capitol Reef N.P., Canyonlands N.P. and Desolation Canyon.
<b>General Threats</b>	<b>Specific Threats</b>	<b>General Conservation Actions</b>	<b>Specific Conservation Actions</b>	<b>Priority</b>
Habitat Loss	Loss and fragmentation of mixed-conifer, riparian and ponderosa pine habitats	Implement Existing Conservation Plan (Mexican Spotted Owl Recovery Plan (MSORP))	Conserve and restore "protected and restricted" habitats to target/threshold conditions	H
Human Disturbance	Disturbance leading to nest or site abandonment or disruption of breeding	Implement Existing Conservation Plan (MSORP)	Establish "Protected Activity Centers" around known nest/roost sites and follow recovery plan guidelines	H
Lack of Information	Insufficient understanding of species and habitat distribution; limited knowledge of disturbance and management effects on owls	Implement Existing Conservation Plan (MSORP)	Conduct extensive survey and monitoring; develop adaptive management and research projects to address management issues	H
Lack of Information	Insufficient knowledge of habitat distribution and probability of owl occurrence in various habitats	Habitat Monitoring and Research	Develop and test habitat model; test occupancy monitoring protocol against predictive habitat model	H



<b>Mountain Plover</b> <i>Charadrius montanus</i> Tier III Bird		<b>Biology and Life History</b>	<b>Population</b>	<b>Distribution</b>
		Typically associated with shortgrass prairie characterized by blue gramma and buffalo grass (Graul 1975).	Very rare in Utah with a single breeding population known to occur in the state (Day 1994). Mountain Plovers have drastically declined in Utah and may now be extirpated. (Parrish et al. 2002).	This species is known to nest in Utah only in a few places in the Uinta Basin
<b>General Threats</b>	<b>Specific Threats</b>	<b>General Conservation Actions</b>		<b>Specific Conservation Actions</b> Priority
Human Disturbance	Disturbance to nesting areas from oil, gas and mining development	Implement Existing Conservation Plan (UTACS)	Create a buffer zone around the breeding areas on Myton Bench	H
Lack of Information	Further information is needed on species' status in Utah	Implement Existing Conservation Plan (UTACS)	Determine current status of species in state	H
Energy Development	Nest sites vulnerable to road construction	Implement Existing Conservation Plan (UTACS)	Determine effects of oil and gas development and associated human disturbance	H

<b>Northern Goshawk</b> <i>Accipiter gentillis</i> Tier I Bird		<b>Biology and Life History</b>	<b>Population</b>	<b>Distribution</b>
		Goshawks nest in large diameter trees (primarily coniferous and aspen forests in Utah) but require relatively open understories in which to forage (primarily for birds) (Graham et al. 1999).	Information on population trend is limited and controversial. Kennedy (1997) found that goshawk densities (abundance) are highly variable, and show no downward trend. There are no reliable statewide trend estimates for Utah.	In the West, goshawks are patchily distributed; in Utah, the species is limited primarily to conifer and aspen forests. Goshawk habitat patches appear to be fairly well connected and allow for goshawk dispersal (Graham et al. 1999).
<b>General Threats</b>	<b>Specific Threats</b>	<b>General Conservation Actions</b>		<b>Specific Conservation Actions</b> Priority
Habitat Loss	Changes in connectivity among suitable habitat stands	Conserve suitable habitat	Maintain and strengthen connectivity of habitat	H
Habitat Loss	Loss of large diameter trees (conifers and aspen) to fire, insects, harvest	Restore degraded habitat	Increase number and distribution of large diameter trees	H
Habitat Loss	Loss of large diameter trees (conifers and aspen) to fire, insects, harvest	Protect significant areas	Avoid removal of existing nest trees and stands	H
Lack of Information	Limited Knowledge of statewide population trends and productivity	Population monitoring and research	Monitor populations and productivity	H

<b>Osprey</b> <i>Pandion haliaetus</i> Tier III Bird		<b>Biology and Life History</b>	<b>Population</b>	<b>Distribution</b>
		Piscivorous raptor; sparsely distributed around mountain lakes and on the Green River.	Considered uncommon in Utah.	Its historical range has been substantially reduced in the state of Utah and nearly all known nesting occurs at Flaming Gorge Reservoir.
<b>General Threats</b>	<b>Specific Threats</b>	<b>General Conservation Actions</b>		<b>Specific Conservation Actions</b> Priority
Lack of Information	Information needed on population and productivity	Population Monitoring and Research	Determine current population status, productivity, and distribution in Utah	M
Environmental Contaminant	Contaminants from pesticides	Population Monitoring and Research	Determine effect of contaminants on productivity and survivorship	M
Habitat Loss	Loss of nest sites in riparian habitats	Protect Significant Areas	Protect known nesting sites and enhance suitable areas with artificial nest structures where appropriate	H

<b>Peregrine Falcon</b> <i>Falco peregrinus</i> Tier III Bird		<b>Biology and Life History</b>	<b>Population</b>	<b>Distribution</b>
		Nesting dates vary with changes in elevation and latitude, though courtship displays in the breeding area usually begin around late March and early April. In mid to late April, the female scrapes a shallow depression in which she lays 3 - 4 (sometimes 5) eggs.	Peregrine Falcon populations declined dramatically from the 1940s to the 1960s, attributed to the residues of DDT. Population has increased since DDT ban, but species is rare in Utah. Population increased in southern portion of the state but not recovered.	In Utah, Peregrine Falcon breeding sites occur in the Utah Mountain (i.e., Wasatch and Uinta Mountains), Basin and Range, Mojave, and Colorado Plateau ecoregions. The largest concentrations are along the Colorado River (including Lake Powell) and its tributaries in the southeastern portion of the state. Current distribution is more limited than in the past (F. Howe unpubl. data).
<b>General Threats</b>	<b>Specific Threats</b>	<b>General Conservation Actions</b>	<b>Specific Conservation Actions</b>	<b>Priority</b>
Lack of Information	Information needed on population and productivity	Implement Existing Conservation Plan (USFWS Peregrine Falcon Monitoring Plan)	Determine current population status, productivity, and distribution	H
Human Disturbance	Disturbance from recreation and harvest	Control and Monitor Disturbance	Determine impact of human disturbance from harvest and recreation	H
Habitat Loss	Human encroachment along the Wasatch Front	Habitat Monitoring and Research	Determine why many historical nest sites remain vacant	M
Environmental Contaminant	Exposure to pesticides and organochlorines, especially on wintering grounds	Education and Outreach	Educate public on proper use and disposal of pesticides	L

<b>Sage Sparrow</b> <i>Amphispiza belli</i> Tier III Bird		<b>Biology and Life History</b>	<b>Population</b>	<b>Distribution</b>
		Shrubsteppe-obligate species (Wiens and Rotenberry 1981).	BBS data shows a stable population trend for this species (Sauer et al. 2005). Uncommon in Utah.	Distributed in suitable habitat throughout Great Basin including western Washington, Wyoming, Arizona, Texas, eastern California, Utah and Nevada. Found locally throughout Utah.
<b>General Threats</b>	<b>Specific Threats</b>	<b>General Conservation Actions</b>	<b>Specific Conservation Actions</b>	<b>Priority</b>
Lack of Information	Information needed on distribution, habitat requirements, and response to habitat alteration	Implement Existing Conservation Plan (UTACS)	Population monitoring including distribution, habitat requirements, and response to habitat alteration	H
Nest Parasitism	Nest parasitism by Brown-headed Cowbirds	Control and Monitor Invasive Species	Determine effect of cowbird parasitism on population; control cowbirds when necessary	M
Habitat Loss	Degradation of preferred shrubsteppe habitat through mechanical and chemical treatments, overgrazing, altered fire regimes, urban encroachment and invasive plants	Implement Existing Conservation Plan (UTACS)	Evaluate species responses to restoration treatments as part of shrubsteppe monitoring program	H
Habitat Loss	Conversion of native to exotic grasses and livestock overgrazing	Education and Outreach	Work with landowners and agencies to maintain a mosaic of shrubsteppe habitat types	H

<b>Sage Thrasher</b> <i>Oreoscoptes montanus</i> Tier III Bird		<b>Biology and Life History</b>	<b>Population</b>	<b>Distribution</b>
		Considered a shrubsteppe obligate. Requires healthy stands of mature sagebrush.	In North America, appears to be stable in areas where it has suitable habitat. In areas with extensive loss of sagebrush, the species' numbers have greatly declined and some local populations have been eliminated (Paige et al. 1999). Breeding Bird Survey shows a 3.4% per year decline in Utah, though the trend may be imprecise (Sauer et al. 2005). Species common in Utah.	Breeds from extreme southern British Columbia, southward through the western United States to northern Arizona and New Mexico. Common resident of lowland desert in Utah.
<b>General Threats</b>	<b>Specific Threats</b>	<b>General Conservation Actions</b>	<b>Specific Conservation Actions</b>	<b>Priority</b>
Lack of Information	Information needed on population and productivity	Population Monitoring and Research	Determine current population status and productivity in Utah.	H
Lack of Information	Information needed on habitat requirements	Habitat Monitoring and Research	Determine habitat requirements (patch size, percent shrub cover) and response to habitat alteration	H
Habitat Loss	Destruction and modification of suitable habitat from various shrubsteppe impacting factors	Habitat Monitoring and Research	Evaluate species responses to restoration treatments as part of shrubsteppe monitoring program	H

<b>Sharp-tailed Grouse</b> <i>Tympanuchus phasianellus</i> Tier II Bird		<b>Biology and Life History</b>	<b>Population</b>	<b>Distribution</b>
		Preferred habitat is Bunch-grass interspersed with deciduous shrubs. Grouse are ground nesters and raise only one brood per year, and are susceptible to predation and population decline.	Rare in Utah. Occurs in only 4% of historic Utah distribution, and populations have severely declined rangewide in the last century (USFWS 2000).	In Utah, the species is limited to a remnant population in eastern Box Elder, Cache, and Morgan counties.
<b>General Threats</b>	<b>Specific Threats</b>	<b>General Conservation Actions</b>	<b>Specific Conservation Actions</b>	<b>Priority</b>
Habitat Loss	Degradation through energy development; exotic weed infestation of habitats; improper grazing; agricultural development	Implement Existing Conservation Plan (UTACS, DWR Sharp-tailed Grouse Plan [DWRSTP])	Identify and enhance fragmented and degraded habitats	H
Habitat Loss	Lack of herbaceous understory in sagebrush habitats; Pinyon-Juniper succession in sagebrush habitats	Implement Existing Conservation Plan (UTACS, DWRSTP)	Identify and protect existing habitat	H
Habitat Loss	Wildfire return intervals in sagebrush habitats	Implement Existing Conservation Plan (UTACS, DWRSTP)	Maintain and restore habitat in breeding complexes, avoid long-term alteration of suitable habitats	H
Human Disturbance	Urbanization and encroachment	Population Monitoring and Research	Monitor population trends; Secure funding for implementation of existing plans	H

<b>Short-eared Owl</b> <i>Asio flammeus</i> Tier II Bird		<b>Biology and Life History</b>	<b>Population</b>	<b>Distribution</b>	
		The Short-eared Owl is an open country, ground-nesting species that occupies grasslands and tundra and is susceptible to predation (Melvin et al. 1989, Tate 1992). Populations of Short-eared Owls are largely dependant on the cyclic abundance of small mammals, such as voles, for prey (Holt and Leasure 1993).	The Breeding Bird Survey indicates significant population declines of about 5.0% per year since 1966 in both the Western Region and Surveywide (Sauer et al. 2005).	In Utah, Short-eared Owls are distributed over most of the state, though they are less wide-spread today than historically. Distribution of this species has decreased markedly in its traditional range along the Wasatch Front in the last few decades (Behle et al. 1985).	
<b>General Threats</b>	<b>Specific Threats</b>	<b>General Conservation Actions</b>	<b>Specific Conservation Actions</b>	<b>Priority</b>	
Habitat Loss	Conversion of grasslands to agriculture reducing suitable habitat for nesting and prey	Habitat Monitoring and Research	Determine effects on nesting and prey availability of grassland conversion and grassland eestablishment under the Conservation Reserve Program	M	
Human Disturbance	Loss and abandonment of nests from human-associated agriculture activities	Control and Monitor Disturbance	Determine which activities effect nesting and how to reduce the impact of these activities	M	
Invasive Animal Species	Predation on fledglings and eggs by skunks, cats, and dogs	Control and Monitor Invasive Species	Determine population effects of predation from expanding natural and domestic predators	L	

<b>Snowy Plover</b> <i>Charadrius alexandrinus</i> Tier III Bird		<b>Biology and Life History</b>	<b>Population</b>	<b>Distribution</b>	
		Shorebird species found along coastlines, salt flats, river sandbars, alkaline lakes, and agricultural ponds.	North American population is relatively small and has declined over much of its range. Studies indicate that breeding populations have declined by 20% from the late seventies to the late eighties (Page et al. 1995). Uncommon in state.	Distributed along the west coast from Washington to Baja and along the gulf coast from Florida to the Yucatan. Summer resident in northern Utah.	
<b>General Threats</b>	<b>Specific Threats</b>	<b>General Conservation Actions</b>	<b>Specific Conservation Actions</b>	<b>Priority</b>	
Lack of Information	Information needed on population and productivity	Population Monitoring and Research	Determine current population status and productivity in Utah	M	
Human Disturbance	Disturbance from recreation	Control and Monitor Disturbance	Determine response to recreation disturbance	L	

Southwestern Willow Flycatcher <i>Empidonax traillii</i> Tier I		Biology and Life History	Population	Distribution
Bird		This bird is a neotropical migrant; birds breed the year after hatching and live only a few years (USFWS 2002). Willow Flycatchers are limited to riparian habitats primarily willow, but often native and mixed exotic species.	The population is estimated at 900-1000 pairs rangewide (USFWS 2002). Recent surveys have indicated from 3 to 11 active breeding territories in Utah (Day 2003).	The subspecies occupies a range south of approximately the 38th parallel from western Colorado to California. Large concentrations occur in southwestern California and south-central Arizona though most sites consist of few nests and are relatively isolated (USFWS 2002). In Utah, only 3 breeding sites (all near St. George) have been confirmed, though areas of probable breeding occur across the south tier of counties.
General Threats	Specific Threats	General Conservation Actions	Specific Conservation Actions	Priority
Habitat Loss	Loss and alteration of lowland riparian habitats from dams, diversions, channelization, grazing, recreation, fire, agriculture and urbanization.	Implement Existing Conservation Plan (Southwestern Willow Flycatcher Recovery Plan [SWFRP])	Protect suitable nesting sites; mitigate losses of suitable habitat; manage and restore lowland riparian for suitable habitat	H
Invasive Plant Species	Encroachment of exotic species, particularly tamarisk and Russian olive, into lowland riparian areas	Implement Existing Conservation Plan (SWFRP)	Implement control programs in such a way as to not impact nesting flycatchers	H
Nest Parasitism	Brood parasitism from Brown-headed Cowbirds resulting in reduced productivity	Implement Existing Conservation Plan (SWFRP)	Implement cowbird trapping programs only under specific circumstances (outlined in recovery plan)	L

Three-toed Woodpecker <i>Picoides tridactylus</i> Tier II		Biology and Life History	Population	Distribution
Bird		Permanent resident of coniferous forests above 8,000 ft, dependent on live and dead trees for foraging and nesting.	Considered common in Utah, but population trends are difficult to determine because occurrences are sporadic and influenced by prey availability. Population declines occur in areas of logging and fire suppression.	This species occurs in northern Alaska, Newfoundland, and mountain areas of western and north-central states. In Utah, it is common in the Uinta Mountains and areas of the Cedar Breaks National Forest.
General Threats	Specific Threats	General Conservation Actions	Specific Conservation Actions	Priority
Human Disturbance	Removal of large snags or salvage logging removes critical nesting and foraging areas	Implement Existing Conservation Plan (UTACS)	Educate the public and agencies on the importance of leaving large snags and the importance of the species in preventing insect epidemics	M
Lack of Information	Information needed on population status and productivity	Implement Existing Conservation Plan (UTACS)	Monitor population and productivity as well as response to habitat alteration (timber, beetle kill) and eruptive behavior	M
Habitat Loss	Fire suppression eliminates fire-killed trees and increases threat of catastrophic wildfire	Implement Existing Conservation Plan (UTACS)	Work with federal land management agencies to restore natural fire regimes and manage salvage harvest to enhance populations	H

<b>Virginia's Warbler</b> <i>Vermivora virginiae</i> Tier III Bird		<b>Biology and Life History</b>	<b>Population</b>	<b>Distribution</b>	
		Uses a variety of semi-open habitats during migration, especially riparian areas (Parrish et al 2002).	In Colorado and southern Rocky Mountains physiographic region a declining trend of 1% is indicated by BBS survey from 1966-1996 (Sauer et al. 2005). Rare in Utah.	Breeding range of Virginia's Warbler almost entirely in southwestern United States (Parrish et al. 2002). Summer resident throughout Utah at mid-elevations.	
<b>General Threats</b>	<b>Specific Threats</b>	<b>General Conservation Actions</b>		<b>Specific Conservation Actions</b>	<b>Priority</b>
Lack of Information	Information needed on population status, life history and effects of fire and grazing	Implement Existing Conservation Plan (UTACS, CPIFP)		Determine current population status, general life history, habitat requirements and response to habitat alteration	M
Habitat Loss	Habitat degradation due fire, grazing, and timber harvest of Gambel Oak and removal and alteration of preferred shrub habitat	Implement Existing Conservation Plan (UTACS)		Survey target areas for species prior to habitat altering activities; manage fire, grazing and timber harvest to enhance habitat	L

<b>Williamson's Sapsucker</b> <i>Sphyrapicus thyroideus</i> Tier III Bird		<b>Biology and Life History</b>	<b>Population</b>	<b>Distribution</b>	
		Nests in high elevation (8000 ft to timberline) mountain forests statewide.	Further research required to determine extent of population declines in Utah. Uncommon in Utah.	Summer resident in mountains throughout Utah.	
<b>General Threats</b>	<b>Specific Threats</b>	<b>General Conservation Actions</b>		<b>Specific Conservation Actions</b>	<b>Priority</b>
Lack of Information	Information needed on population status and productivity	Population Monitoring and Research		Determine current population status, distribution, and productivity	M
Habitat Loss	Fire suppression increases threat of catastrophic wildfire	Control and Monitor Disturbance		Work with federal land management agencies to restore natural fire regimes and manage salvage harvest to enhance populations	H

<b>Yellow-billed Cuckoo</b>		<b>Biology and Life History</b>	<b>Population</b>	<b>Distribution</b>
<i>Coccyzus americana</i> Tier I Bird		Species nests in multilayered (canopy-forming trees with thick shrub layer) riparian forests. Arrives relatively late (June) in breeding season. May abandon breeding areas or forego breeding in years of low food resources (large insects); may parasitize other cuckoos or rarely other species. Cuckoos appear to require large blocks of contiguous habitat.	Populations are not well monitored but decline is evident from historic accounts. Species appears to have been historically uncommon to common in Utah and the Great Basin (Hayward et al. 1985, Ryser 1985) and is now considered extremely rare (Behle et al 1985, Benton 1987).	Distribution is not well understood. The western population segment is limited to disjunct fragments of riparian habitat and is much reduced since the late 1800s (USFWS 2001). Utah's known distribution is statewide but very scattered (Parrish et al. 2002).
<b>General Threats</b>	<b>Specific Threats</b>	<b>General Conservation Actions</b>	<b>Specific Conservation Actions</b>	<b>Priority</b>
Habitat Loss	Loss and fragmentation of multilayered lowland riparian habitats from dams, diversions, channelization, grazing, recreation, fire, agriculture and urbanization	Conserve Suitable Habitat	Manage for large contiguous blocks (>10ha) of multilayered riparian forests	H
Habitat Loss	Loss and fragmentation of multilayered lowland riparian habitats from dams, diversions, channelization, grazing, recreation, fire, agriculture and urbanization	Restore Degraded Habitat	Restore habitats to create large blocks of riparian forest and corridors among existing blocks	H
Habitat Loss	Loss and fragmentation of multilayered lowland riparian habitats from dams, diversions, channelization, grazing, recreation, fire, agriculture and urbanization	Habitat Monitoring and Research	Determine specific habitat requirements through study of occupied breeding habitat in Utah	H
Habitat Loss	Loss and fragmentation of multilayered lowland riparian habitats from dams, diversions, channelization, grazing, recreation, fire, agriculture and urbanization	Protect Significant Areas	Protect known breeding areas	H
Lack of Information	Distribution in Utah is not well understood	Determine and Map Distribution	Develop predictive habitat and distribution model and survey areas predicted to contain cuckoos	H
Lack of Information	Population trend and demographics in Utah are poorly understood	Population Monitoring and Research	Determine nest success and productivity; monitor trends in population and site occupancy	H

## Fishes

Bear Lake Sculpin		Biology and Life History	Population	Distribution
<i>Cottus extensus</i> Tier II  Fish		Species is found throughout the lake in benthic areas. They spawn in mid-April to mid-May and attach their eggs to the underside of rocks where the males guard their egg masses until hatching. After hatching they utilize currents to spread out lake-wide from the rocky spawning areas. Sculpin are opportunistic bottom feeders, but rely on benthic invertebrates and ostracods as their main diet items.	Millions of individuals. The relative abundance of their population is monitored by bottom trawling biennially at standardized sites.	Endemic to Bear Lake.
General Threats	Specific Threats	General Conservation Actions	Specific Conservation Actions	Priority
Limited distribution	Found only in Bear Lake	Population Monitoring and Research	Monitor population status and trends	H
Limited Habitat	Drought may limit available spawning and rearing habitat	Habitat Monitoring and Research	Augment available spawning habitat if feasible	H
Human Disturbance	Species may be negatively affected by increasing human use of Bear Lake for residence and recreation, especially waste water discharges	Population Monitoring and Research	Monitor water quality, encourage sewer systems in new development and conversion from septic to sewer systems in existing development	M
Invasive Animal Species	Introduced lake trout	Population Monitoring and Research	Monitor productivity/survival where lake trout are present; alter lake trout management if required; all lake trout stocked beginning in 2001 and continuing indefinitely are/will be sterile, triploid fish	L

Bear Lake Whitefish		Biology and Life History	Population	Distribution
<i>Prosopium abyssicola</i> Tier II  Fish		Species typically found in water depths of 40m and greater. They spawn in mid-February to mid-March over rocky areas in shallow water since there is little rock at the deeper depths. Feeds almost exclusively on ostracods, but may consume aquatic invertebrates or terrestrial insects that sink to the bottom. They are closely associated with the benthic zone. Species can only be identified to species during spawning. At other times, they are distinguished from Bonneville whitefish by using scale counts above and below their lateral line.	Population size estimates are being developed. The population in Bear Lake is monitored through gill-net catch rates from standardized netting. The percent composition of this species is determined by making scale counts on whitefish subsampled at different depths.	Endemic to Bear Lake.
General Threats	Specific Threats	General Conservation Actions	Specific Conservation Actions	Priority
Limited distribution	Found only in Bear Lake	Population Monitoring and Research	Determine population status and trends	H
Human Disturbance	Species may be negatively affected by increasing human use of Bear Lake for residence and recreation, especially waste water discharges	Habitat Monitoring and Research	Monitor water quality; encourage sewer systems in new development and conversion from septic to sewer systems in existing development	M
Invasive Animal Species	Introduced lake trout	Population Monitoring and Research	Monitor productivity and survival and alter lake trout management if required; all trout stocked beginning in 2001 continuing indefinitely are/will be sterile, triploid fish	L



<b>Bluehead Sucker</b> <i>Catostomus discobolus</i> Tier I		<b>Biology and Life History</b> Widely distributed in the Colorado River Basin. Occur in mainstem rivers and tributary streams from the mouth of the Grand Canyon upstream to headwater reaches of the Green and Colorado rivers. Large adults live in water as deep as 2 to 3 meters and commonly seek cover in the form of pools and undercut banks. Adults almost always found in areas with moderate to fast current and rocky substrates. Larval and juvenile forms use shallower, low-velocity shoreline and backwater areas. Bluehead suckers spawn in spring and early summer at lower elevations and into late summer at higher elevations.	<b>Population</b> Bluehead suckers are found in most historical habitats though declines have been noted in the White River and in the upper Green River into Wyoming. The species is locally abundant in all of the three major sub-drainages of the San Rafael River. In the Bonneville Basin, however, blueheads were only found in the Weber River in 2003 and 2004 and in no streams surveyed in 2005 (Bear, Ogden, and Weber).	<b>Distribution</b> Bluehead sucker are found in the mainstem Green, Colorado, and San Juan rivers and smaller tributaries including the Duchesne, White, Strawberry, Price, San Rafael, Fremont, and Escalante rivers and Muddy Creek. Bluehead sucker are also found in the Weber, Ogden, and Bear rivers in the Bonneville basin.
	Fish			
<b>General Threats</b>	<b>Specific Threats</b>	<b>General Conservation Actions</b>	<b>Specific Conservation Actions</b>	<b>Priority</b>
Hybridization	Loss of genetic integrity through hybridization with white sucker and sometimes flannelmouth sucker	Control and Monitor Invasive Species	Remove nonnative white suckers from bluehead spawning locations	H
Invasive Animal Species	Competition with and predation by a variety of introduced escocids, ictalurids, centrarchids, and cyprinids	Control and Monitor Invasive Species	Remove nonnative predators and competitors from important life history locations	H
Lack of Information	Population status and trends not fully known	Population Monitoring and Research	Determine population status and trends	H
Lack of Information	Life history and habitat needs not entirely known	Habitat Monitoring and Research	Determine habitat needs of all life history stages	H
Water Development	Habitat fragmentation due to development of streams and rivers (dams, diversions)	Determine and Map Distribution	Identify areas that need to be connected and implement appropriate actions	M

<b>Bonneville Cisco</b> <i>Prosopium gemmifer</i> Tier II Fish		<b>Biology and Life History</b>	<b>Population</b>	<b>Distribution</b>	
		Species typically found in schools in the pelagic zone of Bear Lake near the thermocline when the lake is thermally stratified during the fall, winter and spring months. At night, cisco break from their schools and are widely scattered throughout the lake. They spawn from mid-January to the first of February over rocky areas along the shoreline, weedbeds and deeper, rocky shoals. Species feeds almost exclusively on zooplankton. Individuals reach a maximum size of 250mm and are easily visually separated from Bonneville whitefish and Bear Lake whitefish by their pointed snout.	Apparently stable at approximately 2.5 - 3.0 million individuals. The Bear Lake population is monitored annually using hydroacoustic gear.	Endemic to Bear Lake.	
<b>General Threats</b>	<b>Specific Threats</b>	<b>General Conservation Actions</b>	<b>Specific Conservation Actions</b>	<b>Priority</b>	
Limited Distribution	Found only in Bear Lake	Population Monitoring and Research	Monitor population status and trends	H	
Human Disturbance	Species may be negatively affected by increasing human use of Bear Lake for residence and recreation, especially waste water discharges	Habitat Monitoring and Research	Monitor water quality; encourage sewer systems in new development and conversion from septic to sewer systems in existing development	M	
Invasive Animal Species	Introduced lake trout	Population Monitoring and Research	Monitor productivity and survival and alter lake trout management if required; all lake trout stocked beginning in 2001 and continuing indefinitely are/will be sterile, triploid fish	L	
Limited Habitat	Drought may limit available spawning and rearing habitat	Habitat Monitoring and Research	Augment available spawning habitat if feasible	H	

Bonneville Cutthroat Trout		Biology and Life History	Population	Distribution
<i>Oncorhynchus clarki utah</i> Tier I Fish		Bonneville cutthroat trout historically occupied both streams and lakes within the Bonneville Basin. They need habitats with cool, well oxygenated water. Adults spawn in streams from April to July depending on the elevation of occupied habitat. Stream populations typically mature at 2 – 3 years of age while some lake populations may mature later. Eggs are deposited in depressions dug in gravel-riffle areas. Fish less than 15 inches in length typically feed on insects or zooplankton while larger fish begin feeding more on small fish. Brown and brook trout compete with Bonneville cutthroat trout for food and space. Rainbow trout and other subspecies of cutthroat trout can hybridize with Bonneville cutthroat trout populations.	In a recent status review biologists identified approximately 4,400 miles of stream as historic habitat and Bonneville cutthroat trout currently occupy 1,515 miles of stream or 34% of the historic range. Approximately 1,000 stream miles were identified as having population expansion potential. Twenty miles had high potential and 34 miles had intermediate potential for restoration and expansion.	Bonneville cutthroat trout are native to the Bonneville Basin of Utah. Bonneville cutthroat trout are found in the Bear River, Provo, Weber, and Sevier River drainages as well as some other smaller drainages.
General Threats	Specific Threats	General Conservation Actions	Specific Conservation Actions	Priority
Habitat Loss	Loss and fragmentation of streams and riparian habitats from dams, diversions, channelization, grazing, recreation, fire and agriculture	Conserve Suitable Habitat	Work with land management agencies and private landowners to conserve remaining good habitat	H
Habitat Loss	Loss and fragmentation of stream and riparian habitats from dams, diversions, channelization, grazing, recreation, fire, and agriculture	Restore Degraded Habitats	Work with land management agencies and private landowners to restore habitat	H
Habitat Loss	Loss and fragmentation of stream and riparian habitats from dams, diversions, channelization, grazing, recreation, fire and agriculture	Habitat Monitoring and Research	Monitor habitat to establish trends in condition and management	M
Invasive Animal Species	Stocking of non-native species where Bonneville cutthroat trout exist or where stocked fish can migrate into occupied areas	Control and Monitor Invasive Species	Discontinue direct stocking of non-natives, especially fertile non-natives	H
Invasive Animal Species	Stocking of non-native species where Bonneville cutthroat trout exist or where stocked fish can migrate into occupied areas	Control and Monitor Invasive Species	Produce sterile non-natives for stocking where they produce important sport fisheries but have contact with native cutthroat trout populations	H
Hybridization	Hybridization and competition with non-native species	Control and Monitor Invasive Species	Chemically or physically remove non-native salmonids	H
Harvest	Over harvest of adults from existing population	Control and Monitor Disturbance	Place special fishing regulations on waters if needed	M
Disease	Loss of significant numbers of Bonneville cutthroat trout due to various diseases	Test and Monitor Disease	All hatcheries stocking fish into Utah waters must be disease certified	M
Disease	Loss of significant number of Bonneville cutthroat trout due to various diseases	Education and Outreach	Educate anglers and the public about how they can help reduce the spread of disease	M

<b>Bonneville Whitefish</b>		<b>Biology and Life History</b>	<b>Population</b>	<b>Distribution</b>	
<i>Prosopium spilonotus</i> Tier II Fish		Species typically found in depths of up to approximately 40m. They spawn from mid-November to mid-December over rocky areas along the shoreline in water 1 - 2.5m deep or deeper over rocky shoals. Species is omnivorous, but prefer plankton, aquatic invertebrates and terrestrial insects that sink to the bottom. Individuals larger than 350mm are piscivorous and consume other whitefish, Bear Lake sculpin, and other juvenile fish. Species can grow up to 2kg. At total lengths of 250mm and less, a count of scales both above and within their lateral lines must be used to separate the species outside of their respective spawning seasons.	Bear lake population is monitored through gill-net catch rates from standardized netting. The percent composition of individuals smaller than 250mm is determined by making scale counts on whitefish subsampled at different depths.	Bear Lake.	
<b>General Threats</b>	<b>Specific Threats</b>	<b>General Conservation Actions</b>		<b>Specific Conservation Actions</b>	<b>Priority</b>
Limited Distribution	Found only in Bear Lake, typically at 40m and shallower	Population Monitoring and Research		Determine population status and trends	H
Human Disturbance	Species may be negatively affected by Increasing human use of Bear Lake for residence and recreation, especially waste water discharges	Habitat Monitoring and Research		Monitor water quality; encourage sewer systems in new development and conversion from septic to sewer systems in existing development	M
Invasive Animal Species	Introduced lake trout	Population Monitoring and Research		Determine productivity and survival and alter lake trout management if required; all lake trout stocked beginning in 2001 and continuing indefinitely are/will be sterile, triploid fish	L
Limited Habitat	Drought may limit available spawning and rearing habitat	Habitat Monitoring and Research		Augment available spawning habitat if feasible	H

<b>Bonytail</b> <i>Gila elegans</i> Tier I	Fish	<b>Biology and Life History</b>	<b>Population</b>	<b>Distribution</b>
		Bonytails are considered to be adapted to mainstem riverine habitat and are thought to be morphologically adapted to deep, swift, rocky canyon regions in the upper basin, though they have been found in reservoir environments. They are thought to spawn in spring over rocky substrates. Flooded bottomland habitats are thought to be important nursery, growth, and conditioning habitats for the species. Little is known of the preferences of this species due to its rareness.	With the introduction of a variety of threats, bonytail numbers dramatically declined and the species was considered near-extirpated in the wild when a small number of bonytail were collected for broodstock. The Upper Colorado Recovery Program annually stocks 15,990 age 2+ bonytails in mainstem habitats in the upper basin. No population estimates have been made for bonytail as the species is still considered too rare.	Bonytails are one of the four big river endangered fishes of the Colorado River basin. They are found in mainstem habitats in the upper and lower Colorado basin and were once thought to be widespread throughout each basin. Distribution of bonytail is currently quite limited.
<b>General Threats</b>	<b>Specific Threats</b>	<b>General Conservation Actions</b>	<b>Specific Conservation Actions</b>	<b>Priority</b>
Hybridization	Loss of genetic integrity through hybridization with other <i>Gila</i> species	Implement Existing Conservation Plans	Address needs for genetic information described in Recovery Goals	H
Invasive Animal Species	Competition with and predation by a variety of introduced esocids, ictalurids, centrarchids, and cyprinids	Control and Monitor Invasive Species	Remove nonnative predators and competitors from important life history locations	H
Water Development	Habitat fragmentation due to development of streams and rivers (dams, diversions)	Determine and Map Distribution	Identify areas that need to be connected and implement appropriate actions	M
Limited Distribution	Occurs in limited numbers	Population Monitoring and Research	Continue to augment reduced populations	H

<b>Colorado Pikeminnow</b> <i>Ptychocheilus lucuis</i> Tier I	Fish	<b>Biology and Life History</b>	<b>Population</b>	<b>Distribution</b>
		The pikeminnow is known to migrate long distances to and from spawning areas. Adult habitat preferences include pools, deep runs, and eddy habitats maintained by high spring flows. Spawning occurs after spring runoff in response to water temperature. Upon emergence, larvae drift downstream to nursery backwater habitats.	In 2000, researchers estimated a population of 8000 individuals in the Green River and 600-900 individuals in the upper Colorado River. In the San Juan, researchers estimated a population of approximately 160 individuals.	The Colorado pikeminnow is endemic to the Colorado River Basin where it was once widespread and abundant in warm-water reaches of the Colorado mainstem and other larger rivers in the basin. Historical accounts occur for the Green and upper Colorado rivers and many of their tributaries, including the Gunnison, Yampa, San Juan, White, lower Price, and Duchesne rivers. The species still remains in portions of many of these locations, though its overall distribution is estimated to have been reduced by 75%. The species is stocked in many of these locations.
<b>General Threats</b>	<b>Specific Threats</b>	<b>General Conservation Actions</b>	<b>Specific Conservation Actions</b>	<b>Priority</b>
Invasive Animal Species	Competition with and predation by a variety of introduced esocids, ictalurids, centrarchids, and cyprinids	Control and Monitor Invasive Species	Remove nonnative predators and competitors from important life history locations	H
Water Development	Habitat fragmentation due to development of streams and rivers (dams, diversions)	Determine and Map Distribution	Identify areas that need to be connected and implement appropriate actions	M
Water Development	Diversions causing entrainment	Protect Significant Areas	Screen diversions throughout critical habitat and above stocking locations	H
Limited Distribution	Occurs in limited numbers	Population Monitoring and Research	Continue to augment reduced populations	H
Limited Habitat	Life history of species requires traveling long distances	Implement Existing Conservation Plans	Identify areas that need to be connected and implement appropriate actions	M

Colorado River Cutthroat Trout		Biology and Life History	Population	Distribution	
<i>Oncorhynchus clarki pleuriticus</i> Tier I		Fish Colorado River cutthroat trout typically occupied mainly stream habitat but some high lakes also contained populations. They need habitats with cool, well oxygenated water. Adults spawn in streams from April to July depending on the elevation of occupied habitat. Stream populations typically mature at 2-3 years of age. Eggs are deposited in depressions dug in gravel-riffle areas. Fish less than 15 inches in length typically feed on insects or zooplankton while larger fish begin feeding more on small fish. Brown and brook trout compete with Colorado River cutthroat trout for food and space. Rainbow trout and other subspecies of cutthroat trout can hybridize with Colorado River cutthroat trout populations.	In a recent status review, biologists identified approximately 3,400 miles of stream as historic habitat of Colorado River cutthroat trout in Utah. Colorado River cutthroat trout currently occupy approximately 1,100 stream miles in Utah (32% of historic habitat).	Colorado River cutthroat trout historically occupied streams and a few lakes in the Colorado River drainage of Northern and Eastern Utah. Most habitat occupied year long is above 6,500 feet in elevation. Most populations are in headwater areas of drainages. The Blacks Fork, Duchesne, Escalante, Fremont and Green River drainages as well as both the north and south slopes of the Uinta Mountains and Boulder Mountains are currently occupied.	
General Threats	Specific Threats	General Conservation Actions	Specific Conservation Actions	Priority	
Habitat Loss	Loss and fragmentation of stream and riparian habitats from dams, diversions, channelization, grazing, recreation, fire, and agriculture	Conserve Suitable Habitat	Work with land management agencies and private landowners to conserve remaining high quality habitat	H	
Habitat Loss	Loss and fragmentation of stream and riparian habitats from dams, diversions, channelization, grazing, recreation, fire, and agriculture	Restore Degraded Habitat	Work with land management agencies and private landowners to restore habitat	H	
Habitat Loss	Loss and fragmentation of stream and riparian habitats from dams, diversions, channelization, grazing, recreation, fire, and agriculture	Habitat Monitoring and Research	Monitor habitat to establish trends in condition and management	M	
Invasive Animal Specvies	Stocking of non-native species where Colorado River cutthroat trout exist or where stocked fish can migrate into occupied areas	Control and Monitor Invasive Species	Discontinue direct stocking of non-natives, especially fertile non-natives	H	
Invasive Animal Species	Stocking of non-native species where Colorado River cutthroat trout exist or where stocked fish can migrate into occupied areas	Control and Monitor Invasive Species	Produce sterile non-natives for stocking where they produce important sport fisheries but have contact with native cutthroat trout populations	H	
Hybridization	Hybridization and competition with introduced species	Control and Monitor Invasive Species	Chemically or physically remove non-native salmonids	H	
Harvest	Over harvest of adults from existing populations	Control and Monitor Disturbance	Place special fishing regulations on waters if needed	M	
Disease	Potential loss of significant numbers of Colorado River cutthroat trout due to various diseases	Test and Monitor Disease	All hatcheries stocking fish into Utah waters must be disease certified	M	
Disease	Potential loss of significant numbers of Colorado River cutthroat trout due to various diseases	Education and Outreach	Educate anglers and the public about how they can help reduce the spread of disease	M	

<b>Desert Sucker</b>		<b>Biology and Life History</b>	<b>Population</b>	<b>Distribution</b>
<i>Catostomus clarki</i> Tier II Fish		Inhabits pools and low-velocity runs of streams. Adapted for herbivory over cobble runs	Apparently common, but population size and trends unknown	Virgin River drainage.
<b>General Threats</b>	<b>Specific Threats</b>	<b>General Conservation Actions</b>	<b>Specific Conservation Actions</b>	<b>Priority</b>
Lack of information	Full extent of distribution unknown	Determine and Map Distribution	Identify conservation populations	L
Invasive Animal Species	Competition with and predation by black bullhead and red shiner	Control and Monitor Invasive Species	Control red shiner, black bullhead, others	H
Habitat Loss	Habitat fragmentation	Determine and Map Distribution	Identify areas that need to be connected and implement appropriate actions	L

<b>Flannelmouth Sucker</b>		<b>Biology and Life History</b>	<b>Population</b>	<b>Distribution</b>
<i>Catostomus latipinnis</i> Tier I Fish		Typically inhabit pools and deeper runs of larger rivers in the Colorado River Basin. Range thought to be limited by cool water temperatures as they are not usually found above 1,880 meters elevation. Substrate preferences appear to vary from mud and silt to cobble and gravel, though adults appear to prefer hard substrates. Spawn in May and June in Utah and are thought to time spawning on a variety of environmental cues. Young fish appear to use lower velocity habitats than adults and are frequently found in backwaters, eddies, side channels, and shallow riffles. Are thought to have large home ranges and to need both mainstem and tributary habitats for their various life stages.	Flannelmouth sucker appear to be persisting in almost all historical habitats. Most populations have likely experienced declines; however, accurate estimates are not available for most populations of the species. Flannelmouth were thought to be common in the mainstem Green River in 2004, though population estimates from 2001 to 2004 display a possible declining trend, though not statistically significant. In the San Rafael River, flannelmouth are thought to be experiencing a lack of successful spawning. This inability to pull off a successful spawn could be the result of limited or reduced nursery habitat. Flannelmouth are considered common in the mainstem Escalante.	Flannelmouth are found in the Virgin, White, middle and lower Green, Duchesne, Strawberry, Price, San Rafael, San Juan, Colorado, Fremont, Dolores, and Escalante rivers in Utah.
<b>General Threats</b>	<b>Specific Threats</b>	<b>General Conservation Actions</b>	<b>Specific Conservation Actions</b>	<b>Priority</b>
Hybridization	Loss of genetic integrity through hybridization with white sucker and sometimes bluehead or razorback sucker	Control and Monitor Invasive Species	Remove nonnative whitefish from flannelmouth spawning locations	H
Invasive Animal Species	Competition with and predation by a variety of introduced escocids, ictalurids, centrarchids, and cyprinids	Control and Monitor Invasive Species	Remove nonnative predators and competitors from important life history locations	H
Lack of Information	Population status and trends not fully known	Population Monitoring and Research	Determine population status and trends	H
Lack of Information	Life history and habitat needs not entirely known	Habitat Monitoring and Research	Determine habitat needs of all life history stages	H
Water Development	Habitat fragmentation due to development of streams and rivers (dams, diversions)	Determine and Map Distribution	Identify areas that need to be connected and implement appropriate actions	M

<b>Humpback chub</b>		<b>Biology and Life History</b>	<b>Population</b>	<b>Distribution</b>
<i>Gila cypha</i> Tier I	Fish	<p>Humpback chub occur in mainstem riverine habitats and are thought to be morphologically adapted to deep, swift, rocky canyon regions in the upper basin. Adults use eddies and sheltered shoreline habitats maintained by high spring flows. Young humpback chub prefer low-velocity shoreline habitats (eddies and backwaters). Spawning occurs on the descending limb of the hydrograph, depending on water temperatures.</p>	<p>Recent population estimates for the species are as follows: 3000 adults in the Black Rocks and Westwater Canyon populations near the Colorado-Utah border; only a few hundred adults each in Yampa and Cataract canyons; and approximately 1000 adults in the Desolation/Gray canyons reach in Utah.</p>	<p>Humpback chub are thought to prefer canyon-bound reaches of the mainstem Colorado River and its larger tributaries (Little Colorado River, Yampa River, Green River). The Service has identified five existing upper basin populations: Black Rocks, Colorado; Westwater Canyon, Utah; Yampa Canyon, Colorado; Desolation/Gray canyons, Utah; and Cataract Canyon, Utah.</p>
<b>General Threats</b>	<b>Specific Threats</b>	<b>General Conservation Actions</b>	<b>Specific Conservation Actions</b>	<b>Priority</b>
Hybridization	Loss of genetic integrity through hybridization with other <i>Gila</i> species	Implement Existing Conservation Plans	Address needs for genetic information described in Recovery Goals	H
Invasive Animal Species	Competition with and predation by a variety of introduced esocids, ictalurids, centrarchids, and cyprinids	Control and Monitor Invasive Species	Remove nonnative predators and competitors from important life history locations	H
Water Development	Habitat fragmentation due to development of streams and rivers (dams, diversions)	Determine and Map Distribution	Identify areas that need to be connected and implement appropriate actions	H
Limited Distribution	Occurs in limited numbers	Population Monitoring and Research	Continue to augment reduced populations	H
Limited Habitat	Requires canyon bound mainstem river reaches	Protect Significant Areas	Protect and provide adequate flows; limit disturbance	H

<b>June Sucker</b>		<b>Biology and Life History</b>	<b>Population</b>	<b>Distribution</b>
<i>Chasmistes liorus</i> Tier I	Fish	<p>The June sucker is considered an obligatory lake dweller and, similar to other lake suckers, is a mid-water planktivore. June sucker are known to spawn mainly in riverine habitats, though spawning has been observed in lentic refuge habitats. Spawning occurs in late May and June in the lower reaches of the Provo River. Little is known of juvenile and larval life history stages, though larvae are known to drift down to Utah Lake from Provo River spawning beds upon emergence.</p>	<p>The wild population of this species was documented as less than 1000 individuals upon listing in 1986. Recovery efforts, including stocking of hatchery individuals, have brought June sucker numbers up over time; however, biologists and managers are still concerned at the limited number of larvae and juveniles caught in the wild.</p>	<p>Endemic to Utah Lake. Spawning has been observed in the Spanish Fork and Provo rivers. The Utah Division of Wildlife Resources houses broodstock at the Fisheries Experiment Station in Logan, Utah. Refuge populations are managed in Red Butte Reservoir, Camp Creek Reservation, and the Ensign Pond.</p>
<b>General Threats</b>	<b>Specific Threats</b>	<b>General Conservation Actions</b>	<b>Specific Conservation Actions</b>	<b>Priority</b>
Invasive Animal Species	Competition with and predation by a variety of introduced percids, centrarchids, and cyprinids	Control and Monitor Invasive Species	Remove nonnative predators and competitors from important life history locations	H
Water Development	Dewatering for agriculture and municipal uses	Protect Significant Areas	Protect and provide adequate flows; limit disturbance	H
Taxonomic Debate	Exact relationship with Utah sucker is unclear	Population Monitoring and Research	Continue genetics work to determine relationship to Utah suckers ( <i>Catostomus commersoni</i> ) in Utah Lake	H
Limited Distribution	Occurs in limited numbers	Population Monitoring and Research	Continue to augment reduced populations	H
Limited Habitat	Only naturally found in Utah Lake and immediate tributaries	Protect Significant Areas	Protect and provide adequate flows; limit disturbance	H



<b>Least Chub</b> <i>Lotichthys phlegothonitis</i> Tier I		<b>Biology and Life History</b>	<b>Population</b>	<b>Distribution</b>
Fish		A recent study, found that least chub can live up to 6 years of age. This species swims in rather dense, well-ordered schools but is very adept at diving into the bottom vegetation or retreating rapidly into rushes when disturbed. The least chub spawns in the spring when water temperatures reach 16 C. Least chub are thought to be opportunistic feeders, their diets being related to the abundance or availability of food items during different seasons and from different habitat types. Common food items include algae, diatomaceous material, and midge adults, larvae, and pupae. They also eat copepods, ostracods, and whatever invertebrates are available.	In the west desert, populations are stable within the Bishop Springs and Leland Harris and are in a slight decline in the Gandy Marsh sites. The recent drought may be contributing to the decline at Gandy due to the loss of habitat (water). Least chub are declining in Fish Springs due to predation from mosquitofish ( <i>Gambusia affinis</i> ). The long-term viability of all of the west desert populations are threatened by water development. Along the Wasatch Front, least chub are declining in Mona Springs due to the presence of mosquitofish. In the Sevier River drainage, least chub are stable in Mills Valley and Clear Lake.	Least chub persisted in relict wetlands pockets left by the receding Lake Bonneville and Lake Provo. In the eastern half of the basin, least chub occurred historically in streams, freshwater ponds, and wetlands near the Great Salt Lake, in Utah Lake, Beaver River, Parowan Creek, Clear Creek, and Provo River. In the West Desert, least chub occurred historically in several spring complexes in Snake Valley, including Leland Harris Springs, Miller Spring, Gandy Salt Marsh, Bishop Springs, Callao Springs, and Redden Springs. By 1996, the known distribution of least chub had been reduced to one spring complex in the Utah Lake drainage (Mona Spring complex), two locations in the Sevier River basin (Mills Valley and Clear Lake), and three spring complexes in Snake Valley (Leland Harris Springs, Gandy Salt Marsh, and Bishop Springs).
<b>General Threats</b>	<b>Specific Threats</b>	<b>General Conservation Actions</b>	<b>Specific Conservation Actions</b>	<b>Priority</b>
Water Development	Habitat fragmentation due to development of streams and rivers (dams, diversions)	Control and monitor disturbance	Control disturbance through mitigation and regulation	M
Invasive Animal Species	Competition with and predation by mosquitofish ( <i>Gambusia affinis</i> )	Control and monitor invasive species	Chemical and mechanical removal of mosquitofish	H
Habitat Loss	Population status and trends not fully known	Determine and map distribution	Inventory historic areas for least chub and for potential reintroduction sites.	H
Limited Distribution	Species occurs in limited areas	Increase Distribution	Augment populations, expand range into historical areas	H
Water Development	Habitat fragmentation due to development of streams and rivers (dams, diversions)	Permanent conservation of habitat	Pursuit of conservation easements for least chub habitats	H

<b>Leatherside Chub</b> <i>Gila copei</i> Tier II		<b>Biology and Life History</b>	<b>Population</b>	<b>Distribution</b>
Fish		Small to medium sized rivers. Current literature suggests species is most closely related to spinedace ( <i>Lepidomeda</i> ) species, and that two distinct species are present in Utah. Northern population is more closely related to other spinedace than it is to southern population	Locally stable, but declining or lost in other areas. Some higher elevation Bear River populations stable. Museum specimens from lower Bear River drainage north of Great Salt Lake, but not currently known from this location. Limited distribution in Weber. Population reduced but stable in Sevier and Provo river systems.	Northern population inhabits Weber and Bear river drainages and may inhabit Snake River drainage. Southern population inhabits Provo and Sevier river drainages.
<b>General Threats</b>	<b>Specific Threats</b>	<b>General Conservation Actions</b>	<b>Specific Conservation Actions</b>	<b>Priority</b>
Taxonomic Debate	Ongoing taxonomic debate; 2 or more species possible in Utah	Population Monitoring and Research	Synthesize and summarize available literature to clarify taxonomy. Available literature on this subject has been accumulating in recent years	H
Invasive Animal Species	Brown trout limiting in some areas	Determine and Address Factors Limiting Recovery	Determine conditions for co-existence and replicate; control nonnatives if necessary	H
Human Disturbance	Dewatering for agriculture	Protect Significant Areas	Provide and protect flows	M

<b>Longnose Dace</b> <i>Rhinichthys cataractae</i> Tier III Fish		<b>Biology and Life History</b>	<b>Population</b>	<b>Distribution</b>
		Found in variety of habitats, mostly in lentic waters or can inhabit turbulent streams.	Apparently stable, but population size and trends unknown.	Widely distributed in diverse habitats, mostly located in the Northeastern part of the Bonneville system in the Great Basin.
<b>General Threats</b>	<b>Specific Threats</b>	<b>General Conservation Actions</b>		<b>Specific Conservation Actions</b> Priority
Lack of information	Lost in some historic drainages	Population Monitoring and Research	Determine population status and trends	M
Lack of Information	Current distribution not well described	Determine and Map Distribution	Survey historic waters and suitable habitats	M

<b>Paiute Sculpin</b> <i>Cottus beldingi</i> Tier III Fish		<b>Biology and Life History</b>	<b>Population</b>	<b>Distribution</b>
		Prefers clear, cold streams with rocky substrate. Commonly found with trout.	Limited information. Actual numbers unknown.	Found in Weber, Bear, Logan, Blacksmith Fork, and Sevier (Piute county) rivers. Validity of Thistle Creek observations unconfirmed.
<b>General Threats</b>	<b>Specific Threats</b>	<b>General Conservation Actions</b>		<b>Specific Conservation Actions</b> Priority
Lack of Information	Lost in some historic drainages	Determine and Map Distribution	Determine extent of distribution	H
Lack of Information	Taxonomic debate; populations may be distinct	Population Monitoring and Research	Study by qualified investigator needed to clarify taxonomy	L
Lack of Information	Population status and trends unknown	Population Monitoring and Research	Determine population status and trends	H

<b>Razorback Sucker</b> <i>Xyrauchen texanus</i> Tier I Fish		<b>Biology and Life History</b>	<b>Population</b>	<b>Distribution</b>
		Razorback suckers are adapted to warm-water reaches of larger rivers in the Colorado River Basin. Habitats used by the species varies with life stage and season. In spring, adults use deep runs, eddies, backwaters, and flooded off-channel environments. In summer, with decreases in flows, they move into runs and pools in shallow water near sandbars. In higher winter flows, they use low-velocity runs, pools, and eddies. Spawning occurs in spring over cobble, gravel, and sand bars. Larval and juvenile razorbacks require quiet, warm, shallow nursery environments such as tributary mouths, backwaters, or inundated floodplain habitats.	Low survival in this species is thought to be a result of limited recruitment of juvenile fish into the adult population. Because of this, hatchery razorbacks are grown out to 300 mm and released to increase the potential of survival of stocked individuals. Natural recruitment of this species is known to occur in nonnative-free floodplain and flooded bottomland habitats. Recovery efforts are focused on these aspects of the species' needs.	Historic distribution of the razorback sucker included the mainstem Colorado River and many of its tributaries in both the upper and lower basins, including the Green, White, Duchesne, Little Snake, Yampa, Gunnison, and San Juan rivers. The species was thought to be common and possibly locally abundant in lower reaches of its occupied habitats. The current distribution includes only a small population in the Green and San Juan rivers. The species is stocked in parts of the Colorado, Gunnison, San Juan and Green rivers.
<b>General Threats</b>	<b>Specific Threats</b>	<b>General Conservation Actions</b>		<b>Specific Conservation Actions</b> Priority
Hybridization	Loss of genetic integrity through occasional hybridization with flannelmouth sucker	Implement Existing Conservation Plan	Implement genetics work on level of introgression present in upper basin populations	M
Invasive Animal Species	Competition with and predation by a variety of introduced esocids, ictalurids, centrarchids, and cyprinids	Control and Monitor Invasive Species	Remove nonnative predators and competitors from important life history locations	H
Water Development	Habitat fragmentation due to development of streams and rivers (dams, diversions)	Determine and Map Distribution	Identify areas that need to be connected and implement appropriate actions	H
Limited Distribution	Occurs in limited numbers	Population Monitoring and Research	Continue to augment reduced populations	H

<b>Redside Shiner</b>		<b>Biology and Life History</b>	<b>Population</b>	<b>Distribution</b>
<i>Richardsonius balteatus</i> Tier III Fish		Found mostly in lentic waters but can also be found in streams and irrigation ditches.	Population size and trends unknown.	Occurs in Great Basin drainages.
<b>General Threats</b>	<b>Specific Threats</b>	<b>General Conservation Actions</b>	<b>Specific Conservation Actions</b>	<b>Priority</b>
Lack of Information	Lost in some historic drainages	Determine and Map Distribution	Determine extent of distribution in Utah	H
Lack of Information	Population status and trends unknown	Population Monitoring and Research	Determine population status and trends	H

<b>Roundtail chub</b>		<b>Biology and Life History</b>	<b>Population</b>	<b>Distribution</b>
<i>Gila robusta</i> Tier I Fish		Occur in predominantly pool-riffle habitats in mainstem and larger tributaries in the Colorado River Basin. Adults prefer slow-moving, deep pools with access to feeding areas and cover. Most often found in habitat with sand-gravel substrates. Roundtail spawn in spring and summer, depending on water temperature, on the descending limb of the hydrograph. Juvenile roundtail are usually found in shallower, lower-velocity habitat than adults. Larvae use low-velocity backwaters.	Extirpated from the Price River, portions of the San Juan and Green rivers. Remaining populations declining in the San Juan, White, Yampa, and Green rivers. Populations appear stable in the Escalante, Population estimates largely unavailable for the species.	Roundtail are currently found in the mainstem Colorado River above Moab, mainstem Green River, and occasionally in the mainstem San Juan River. Tributary occurrences include several tributaries to the San Juan River, and the Escalante, Fremont, White, Yampa, Duschesne, and Dolores rivers.
<b>General Threats</b>	<b>Specific Threats</b>	<b>General Conservation Actions</b>	<b>Specific Conservation Actions</b>	<b>Priority</b>
Hybridization	Loss of genetic integrity through hybridization with other <i>Gila</i> species	Implement Existing Conservation Plan	Continue important genetic work on <i>Gila</i> species	H
Invasive Animal Species	Competition with and predation by a variety of introduced esocids, ictalurids, centrarchids, and cyprinids	Control and Monitor Invasive Species	Remove nonnative predators and competitors from important life history locations	H
Water Development	Dewatering for agriculture and municipal uses	Protect Significant Areas	Protect and provide adequate flows; limit disturbance	H
Water Development	Habitat fragmentation due to development of streams and rivers (dams, diversions)	Determine and Map Distribution	Identify areas that need to be connected and implement appropriate actions	H
Limited Habitat	Found in tributary reaches that are often used for agricultural and municipal needs	Protect Significant Areas	Protect and provide adequate flows; limit disturbance	H

<b>Speckled Dace</b>		<b>Biology and Life History</b>	<b>Population</b>	<b>Distribution</b>
<i>Rhinichthys osculus</i> Tier III Fish		Found mostly in lotic water, but can tolerate diverse habitats. Is the only fish species that is native to all the major western drainage systems.	Population size and trends unknown.	Widely distributed in diverse habitats in the western United States.
<b>General Threats</b>	<b>Specific Threats</b>	<b>General Conservation Actions</b>	<b>Specific Conservation Actions</b>	<b>Priority</b>
Lack of Information	Lost in some historic drainages	Determine and Map Distribution	Determine extent of distribution in Utah	M
Lack of Information	Ongoing taxonomic debate; literature from last two decades indicates that populations may be distinct. Different distinct subspecies recognized in Nevada	Population Monitoring and Research	Study by qualified investigator needed to clarify taxonomy	M
Lack of Information	Population status and trends unknown	Population Monitoring and Research	Determine population status and trends	M

<b>Utah Chub</b>		<b>Biology and Life History</b>	<b>Population</b>	<b>Distribution</b>
<i>Gila atraria</i> Tier III Fish		Occurs primarily in lentic waters.	Population size and trends unknown.	Found in a wide variety of habitats throughout Utah.
<b>General Threats</b>	<b>Specific Threats</b>	<b>General Conservation Actions</b>	<b>Specific Conservation Actions</b>	<b>Priority</b>
Environmental Contamination	Poisoned by chemical control	Population Monitoring and Research	Evaluate population response to change	H
Lack of Information	Taxonomic debate	Population Monitoring and Research	Study by qualified investigator needed to clarify taxonomy	M
Lack of Information	Complete distribution not well described	Determine and Map Distribution	Determine extent of distribution in Utah	M

<b>Utah Lake Sculpin - extinct</b>		<b>Biology and Life History</b>	<b>Population</b>	<b>Distribution</b>
<i>Cottus echinatus</i> Tier III Fish		Occurs in deep lentic waters.	Population may be extinct	Native to Utah Lake.
<b>General Threats</b>	<b>Specific Threats</b>	<b>General Conservation Actions</b>	<b>Specific Conservation Actions</b>	<b>Priority</b>
Lack of Information	May be extinct	Determine and Map Distribution	Monitor for trend information	L
Lack of Information	Taxonomic debate; populations may be distinct	Population Monitoring and Research	Study by qualified investigator needed to clarify taxonomy	L

<b>Utah Sucker</b>		<b>Biology and Life History</b>	<b>Population</b>	<b>Distribution</b>
<i>Catostomus ardens</i> Tier III Fish		Occurs in lotic water.	Population size and trend unknown.	Northern-central Utah rivers, streams and lakes.
<b>General Threats</b>	<b>Specific Threats</b>	<b>General Conservation Actions</b>	<b>Specific Conservation Actions</b>	<b>Priority</b>
Lack of Information	Reduced in some historic drainages	Determine and Map Distribution	Determine extent of distribution in Utah	H
Lack of Information	Taxonomic debate; UT L. populations may be distinct	Population Monitoring and Research	Study by qualified investigator to clarify taxonomy initiated 2002	H
Lack of Information	Status and trend of population not well known	Population Monitoring and Research	Determine population status and trends	H

Virgin River Chub		Biology and Life History	Population	Distribution	
<i>Gila seminuda</i> Tier I Fish		Average life span of Virgin River chub is probably eight to ten years. Medium sized, silvery minnow reaching lengths of 25 cm and on average is around 15 cm. Back, breast and part of belly has small, deeply embedded scales, absent in some individuals. Breeding ecology is similar to other roundtail chubs. Roundtails breed during spring and early summer in pools with cover. It is found along the mainstem of the Virgin River in deep pools where water is swift but not turbulent and is associated with boulders or other cover in the river.	Population drastically reduced in range, stable in remaining portion.	Virgin River chub occurred historically in the Muddy River in Nevada, and in the mainstem Virgin River from Pah Tempe Springs to the confluence with the Colorado River in Nevada. Currently, this species occurs in the Muddy River and the Virgin River upstream from the Mesquite Diversion, AZ, to Pah Tempe, UT. Virgin River chub have not been collected below Mesquite since the mid-1960s.	
General Threats	Specific Threats	General Conservation Actions	Specific Conservation Actions	Priority	
Water Development	Diversions causing entrainment	Education and Outreach	Develop public awareness and solicit community involvement	M	
Invasive Animal Species	Competition with and predation by non-native red shiner ( <i>Cyprinella lutrensis</i> )	Control and Monitor Invasive species	Chemical and mechanical removal of red shiner	H	
Habitat Loss	Degradation and fragmentation of habitat. Flow depletions degrade water quality, during summer low flow periods. These factors are potentially limiting fish in their last stronghold above the Washington Fields Diversion, Utah	Conserve Suitable Habitat	Evaluate and assess population status and trends. Implement limiting factors, studies, sediment management, and flow augmentation studies	H	
Limited Distribution	Occurs in limited area and number	Restore Degraded Habitats	Maintain Virgin River chub broodstock	M	
Water Development	Habitat fragmentation due to development of streams and rivers (dams, diversions)	Restore Degraded Habitats	Protect and conserve flows and riparian habitat. Construct Washington Fields Diversion (WFD) fish screen. Implement winter flow reduction study to restore annual flow below the WFD in dewatered reaches	H	

<b>Virgin Spinedace</b> <i>Lepidomeda mollispinis</i> Tier I Fish		<b>Biology and Life History</b> The Virgin spinedace life span can be as long as three years. Spawning season extends through most of the spring and continues into early summer. The primary factors affecting the reproductive cycle are photoperiod and water temperature. Sexual dimorphism is slight, but is most pronounced during the peak spawning period. Based on collections, age 1 fish ranged between 55-76 mm SL and age 2 fish ranged between 76-85 mm SL. The largest collected fish during the sampling period was 128 mm SL. Virgin spinedace rarely exceed 88 mm SL.	<b>Population</b> Virgin spinedace is confined to the Virgin River Basin, inhabiting the Virgin River mainstem and several tributary streams. Population is stable in the mainstem above the Quail Creek Diversion. Current tributary population status: North Fork (population stable), East Fork (population stable), North Creek (population increasing since augmentation), La Verkin Creek (population low but stable), Ash Creek (populations extirpated), Moody Wash (populations fluctuating), Santa Clara (population low but re-introduction projects underway), Lytle Ranch (population stable), and Motoqua (populations fluctuating).	<b>Distribution</b> Historically, Virgin spinedace distribution included the mainstem Virgin River and several tributaries in southwestern Utah, northwestern Arizona, and southeastern Nevada. In Utah, Virgin Spinedace are monitored along the mainstem Virgin River and several tributaries to the Virgin River since 1994. Tributaries include the following: North Fork, East Fork, North Creek, La Verkin Creek, Ash Creek, Moody Wash, Santa Clara and Lytle Ranch. Limited Virgin spinedace populations occur in the Virgin River and Beaver Dam Wash in Nevada and Arizona.
<b>General Threats</b>	<b>Specific Threats</b>	<b>General Conservation Actions</b>	<b>Specific Conservation Actions</b>	<b>Priority</b>
Invasive Animal Species	Competition with and predation by a variety of introduced esocids, ictalurids, centrarchids, and cyprinids	Control and Monitor Invasive Species	Chemical and mechanical removal of red shiner and other species	H
Water Development	Habitat fragmentation due to development of streams and rivers (dams, diversions).	Restore Degraded Habitats	Protect and conserve flows and riparian habitat. Re-establish permanent flows and Virgin spinedace population in the Santa Clara River below Gunlock Reservoir; provide fish passage / screening at diversion structures	H
Water Development	Diversions causing entrapment	Control and Monitor Disturbance	Modify diversions	M
Limited Distribution	Occurs in limited area and number	Restore Degraded Habitats	Maintain Virgin spinedace refuge populations and implement re-introduction projects (Santa Clara, Beaver Dam Wash, North Creek); implement Zion Canyon floodplain / riparian corridor restoration and associated Virgin spinedace monitoring	M
Habitat Loss	Degradation and fragmentation of habitat. Flow depletions degrade water quality (temp., turbidity, dissolved oxygen), during summer low flow periods.	Conserve Suitable Habitat	Evaluate and assess population status and trends. Implement limiting factors, studies, sediment management, and flow augmentation studies	H

<b>Woundfin</b> <i>Plagopterus argentissimus</i> Tier I Fish		<b>Biology and Life History</b>	<b>Population</b>	<b>Distribution</b>
		The life span of most woundfin is estimated to be less than two years, but some individuals may live as long as three years. Sexual maturity is generally achieved in the second summer. Spawning occurs primarily in April and May, but may continue sporadically through the summer. Woundfin are capable of spawning more than once per year, and may spawn as late as September under suitable conditions. Timing of reproduction is likely dependent on a combination of increasing water temperatures, increasing photoperiod, and declining stream flow.	Population vulnerable. Population drastically reduced in range and numbers; however, increasing due to intensive management through the Virgin River Program.	Woundfin historically occurred in lower La Verkin Creek and the Virgin River from Pah Tempe Springs, UT downstream to Lake Mead NV. Woundfin are currently restricted (due to invasion of red shiner) to 19 km of the Virgin River between Pah Tempe and the Washington Fields Diversion, UT.
<b>General Threats</b>	<b>Specific Threats</b>	<b>General Conservation Actions</b>	<b>Specific Conservation Actions</b>	<b>Priority</b>
Water Development	Diversions causing entrainment	Education and Outreach	Develop public awareness and solicit community involvement	M
Habitat Loss	Degradation and fragmentation of habitat. Flow depletions degrade water quality, during summer low flow periods. These factors are potentially limiting fish in their last stronghold above the Washington Fields Diversion, Utah	Conserve Suitable Habitat.	Evaluate and assess population status and trends. Implement limiting factors, studies, sediment management, and flow augmentation studies	H
Invasive Animal Species	Competition with and predation by non-native red shiner ( <i>Cyprinella lutrensis</i> )	Control and Monitor Invasive Species	Chemical and mechanical removal of red shiner	H
Limited Distribution	Occurs in limited area and number	Restore Degraded Habitats	Maintain woundfin broodstock and implement annual stocking into Virgin River	M
Water Development	Habitat fragmentation due to development of streams and rivers (dams, diversions).\	Restore Degraded Habitats	Protect and conserve flows and riparian habitat. Construct Washington Fields Diversion (WFD) fish screen. Implement winter flow reduction study to restore annual flow below the WFD in dewatered reaches	H

<b>Yellowstone Cutthroat Trout</b> <i>Oncorhynchus clarki bouvieri</i> Tier II Fish		<b>Biology and Life History</b>	<b>Population</b>	<b>Distribution</b>
		Occurs in clear, cold streams, small rivers and lakes.	Population size and trends unknown.	Raft River drainage and in Goose Creek in Box Elder County.
<b>General Threats</b>	<b>Specific Threats</b>	<b>General Conservation Actions</b>	<b>Specific Conservation Actions</b>	<b>Priority</b>
Hybridization	Loss of genetic integrity through cross-breeding with rainbow trout	Control and Monitor Invasive Species	Segregate populations as possible, e.g., barriers	H
Disease	Whirling disease	Test and Monitor Disease	Segregate populations as possible, e.g., barriers	H
Human Disturbance	Stock watering in streams	Restore Degraded Habitats	Provide enclosures and control stock watering	H

## Mammals

<b>Abert's Squirrel</b>		<b>Biology and Life History</b>	<b>Population</b>	<b>Distribution</b>
<i>Sciurus aberti</i> Tier III Mammal		Dependent upon Ponderosa Pine habitat, hypogeous fungi as primary food source (Oliver 1997).	Abundance is low in Utah due to limited distribution. 3 possible disjunct populations in San Juan and Grand counties. Boschen (1986) estimated that population increased following his study.	3 areas in San Juan county (principally the Abajo and LaSal Mountains).
<b>General Threats</b>	<b>Specific Threats</b>	<b>General Conservation Actions</b>	<b>Specific Conservation Actions</b>	<b>Priority</b>
Limited Distribution	Limited distribution in Utah; 3 discontinuous populations vulnerable to extirpation	Population Monitoring and Research	Determine status of populations in Utah	H
Human Disturbance	Logging efforts remove mature Ponderosa stands and primary food source (hypogeous fungi)	Control and Monitor Disturbance	Manage logging practices in areas of species distribution in accordance with management recommendations	M

<b>Allen's Big-eared Bat</b>		<b>Biology and Life History</b>	<b>Population</b>	<b>Distribution</b>
<i>Idionycteris phyllotis</i> Tier II Mammal		Reported from a wide range of habitats. Maternity colonies have been located in mine tunnels and boulder piles.	One of the two rarest bats in Utah, approx. 11 specimens recorded. Population trend unknown. Some maternity colonies have disappeared.	Occurs in southern third of state. Known in Grand, San Juan, Washington, Garfield and Kane Counties.
<b>General Threats</b>	<b>Specific Threats</b>	<b>General Conservation Actions</b>	<b>Specific Conservation Actions</b>	<b>Priority</b>
Human Disturbance	Human disturbance to roosting sites and mine closure	Control and Monitor Disturbance	Limit human disturbance to roosting sites (particularly maternity colonies); employ current recommendations for mine closure, survey, and construction of bat gates	H
Environmental Contamination	Pesticide use in foraging areas	Population Monitoring and Research	Determine effects of pesticide use in important foraging areas on population viability and survivorship	L
Lack of Information	Information needed on current population status and trend	Population Monitoring and Research	Determine current population status and trend	H
Development	Major roosts threatened by road development and highway relocation	Permanent Conservation of Habitat	Permanent Conservation of Habitat	M

<b>American Marten</b>		<b>Biology and Life History</b>	<b>Population</b>	<b>Distribution</b>
<i>Martes americana</i> Tier III Mammal		The males are solitary, associating with females only in July and August. The young are born and raised in grass-lined nests in hollow trees or in cavities in rocks.	Abundance in Utah considered low. Hargis (1991) captured 19 individuals.	Distributed in the eastern mountainous regions of the state.
<b>General Threats</b>	<b>Specific Threats</b>	<b>General Conservation Actions</b>	<b>Specific Conservation Actions</b>	<b>Priority</b>
Lack of Information	Population status and trend unknown	Population Monitoring and Research	Determine population status and trend	H
Development	Road construction	Control and Monitor Disturbance	Determine population status and trend	H
Habitat Loss	Logging where spruce-fir forests are not protected	Control and Monitor Disturbance	Determine population status and trend	H



<b>American Pika</b> <i>Ochotona princeps</i> Tier III Mammal		<b>Biology and Life History</b>	<b>Population</b>	<b>Distribution</b>
		Found in high mountainous regions. Pikas are highly social and live in large colonies usually associated with boulder fields or rock slides.	Population in the state of Utah is low due to habitat discontinuity. Population trend unknown.	Discontinuously distributed throughout the mountain regions of Utah.
<b>General Threats</b>	<b>Specific Threats</b>	<b>General Conservation Actions</b>	<b>Specific Conservation Actions</b>	<b>Priority</b>
Limited Distribution	Populations distributed discontinuously throughout the state; vulnerable to local extirpation	Population Monitoring and Research	Determine productivity and survivorship at known locations	H
Lack of Information	Habitat destruction may be a threat but some human disturbance is seemingly beneficial	Habitat Monitoring and Research	Determine productivity and survivorship at known locations	H

<b>Big Free-tailed Bat</b> <i>Nyctinomops macrotis</i> Tier II Mammal		<b>Biology and Life History</b>	<b>Population</b>	<b>Distribution</b>
		Inhabit rugged rocky environments and sagebrush flats. Requires tall cliffs for roost sites. May migrate from northern regions for the winter months.	Fairly rare (Zevloff 1988) At least 34 known specimens. Population trend unknown. Represents .5-3.4% of bat captures (George Oliver, pers. comm.)	Southwest and Southeast corners of the state, as well and south-central area. Distribution may be fairly fragmented (Barber and Davis 1969).
<b>General Threats</b>	<b>Specific Threats</b>	<b>General Conservation Actions</b>	<b>Specific Conservation Actions</b>	<b>Priority</b>
Environmental Contamination	Pesticide use in foraging areas	Population Monitoring and Research	Determine effects of pesticide use in important foraging areas on population viability and survivorship	M
Harvest	Scientific collecting	Determine and Address Factors Limiting Recovery	Regulate collection and monitor population	M
Limited Distribution	Limited to southern Utah but does not occur in many places where habitat seems suitable	Population Monitoring and Research	Population Monitoring and Research	M

<b>Black-footed ferret</b> <i>Mustela nigripes</i> Tier I Mammal		<b>Biology and Life History</b>	<b>Population</b>	<b>Distribution</b>
		Closely associated with prairie dog colonies. Lives in underground prairie dog burrows and consumes prairie dogs as primary food source.	Considered rare in the state. There is currently only one population as the result of an ongoing reintroduction effort.	This species is found in eastern Uintah County.
<b>General Threats</b>	<b>Specific Threats</b>	<b>General Conservation Actions</b>	<b>Specific Conservation Actions</b>	<b>Priority</b>
Disease	Plague, Canine distemper, Tularemia	Test and Monitor Disease	Monitor prevalence of disease in the environment through testing prey and predator populations; UDWR is participating in an experimental plague vaccine study in released ferrets	H
Environmental Contamination	Rodenticide and agricultural control measures negatively impact prairie dog populations	Population Monitoring and Research	Determine effects of agricultural control on prairie dogs	M
Habitat Loss	Habitat disturbance leads to loss of prairie dog colonies	Protect Significant Areas	Avoid direct impacts to prairie dog colonies by providing appropriate buffers between colonies and disturbance	H
Energy Development	Loss of prairie dog colonies	Control and Monitor Disturbance	Avoid direct impacts to prairie dog colonies by providing appropriate buffers between colonies and construction of well pads, roads and other structures	H
Limited Distribution	Only one population in the state	Population Monitoring and Research	Participate in USFWS reintroduction efforts	H

<b>Canada Lynx</b>		<b>Biology and Life History</b>	<b>Population</b>	<b>Distribution</b>
<i>Lynx canadensis</i> Tier I Mammal		Closely associated with snowshoe hare populations. Canada lynx live in high elevation deep snow areas where they have a competitive advantage over other similarly sized carnivores because of their large feet and long legs.	Unknown - the natural population has probably been extirpated, however a population has been established in Colorado through reintroduction. Animals from Colorado occasionally enter the state, but none are known to have settled in Utah. Eventual settlement in Utah is anticipated.	Historically found in the Uintah Mountains.
<b>General Threats</b>	<b>Specific Threats</b>	<b>General Conservation Actions</b>		<b>Specific Conservation Actions</b> <span>Priority</span>
Human Disturbance	Creation of packed trails into deep snow areas through recreation activities (e.g. snowmobiling) provides travel corridors for potential competitors into lynx habitat	Control and Monitor Disturbance	Monitor dispersal of lynx into Utah from surrounding states and monitor the impacts of human facilitated competition	H

<b>Dark Kangaroo Mouse</b>		<b>Biology and Life History</b>	<b>Population</b>	<b>Distribution</b>
<i>Microdipodops megacephalus</i> Tier II Mammal		The two races that occur in Utah are endemic to the state (Oliver 1997).	Seemingly rare in Utah, with only eight localities in the state. Population appears to have declined since 1960 (Eric Rickart pers. comm. 1997).	Occurs only in the desert areas of Toole, Juab, Millard and Beaver counties. Overall range is patchy and somewhat discontinuous. Substantial amount of overall range occurs in Utah (Zevloff 1988).
<b>General Threats</b>	<b>Specific Threats</b>	<b>General Conservation Actions</b>	<b>Specific Conservation Actions</b>	<b>Priority</b>
High Percent of Global Population	Substantial amount of overall range occurs in Utah; Drastic large-scale habitat change has occurred in known areas of occurrence	Population Monitoring and Research	Determine current population status and distribution	H
Lack of Information	Information needed on impacts of habitat changes on population viability	Population Monitoring and Research	Evaluate effect of large scale habitat changes on populations in Utah	M
Habitat Loss	Drastic habitat changes due to invasive grass species and increase in wildfire frequency	Habitat Monitoring and Research	Evaluate effect of large scale habitat changes on populations in Utah	M

<b>Desert Kangaroo Rat</b>		<b>Biology and Life History</b>	<b>Population</b>	<b>Distribution</b>
<i>Dipodomys deserti</i> Tier III Mammal		This species occupies washes and riverbeds with loose shifting sand.	Population has declined somewhat due to loss of habitat.	Found in western Nevada, southern California, and adjacent Mexico (Zevloff 1988). Limited to one location in Utah (Beaver Dam Wash, Washington County).
<b>General Threats</b>	<b>Specific Threats</b>	<b>General Conservation Actions</b>	<b>Specific Conservation Actions</b>	<b>Priority</b>
Limited Distribution	Limited to Beaver Dam Wash in Washington Co.; vulnerable to periodic flooding and extirpation	Population Monitoring and Research	Monitor population status, productivity and survival	M
Environmental Contamination	Indiscriminate use of poisons to control gophers poses significant threat to species	Education and Outreach	Educate the public on detrimental effects of indiscriminate use of poisons	M

<b>Desert Shrew</b>		<b>Biology and Life History</b>	<b>Population</b>	<b>Distribution</b>
<i>Notiosorex crawfordi</i> Tier III Mammal		Occurs in semidesert scrub communities with plants such as mesquite or agave. Rely on woodrat dens for shelter.	Only three known occurrences in Utah (Wauer 1965). Seemingly very rare. Population trend not known.	Occurs in three known localities in Utah (Near St. George, Zion National Park in Washington Co. and Capitol Reef National Park in Garfield Co.).
<b>General Threats</b>	<b>Specific Threats</b>	<b>General Conservation Actions</b>	<b>Specific Conservation Actions</b>	<b>Priority</b>
Lack of Information	Population status and threats are unknown	Population Monitoring and Research	Determine population distribution and status	M
Lack of Information	Nominal species <i>N. crawfordi</i> has recently split into 2 spp. And the authors warn that other, unnamed species could exist in what had been called <i>N. crawfordi</i> . What species of <i>Notiosorex</i> occurs in Utah is unknown	Morphological and molecular genetic research	Determine what species occurs in Utah	H

<b>Dwarf Shrew</b>		<b>Biology and Life History</b>	<b>Population</b>	<b>Distribution</b>
<i>Sorex nanus</i> Tier III Mammal		High-elevation species prefers alpine or subalpine rockslides.	Four individuals reported for the state (Durrant and Lee 1955). Population trends unknown.	Known only from Abajo Mountains and Uinta Mountains and recently discovered in the La Sal Mountains.
<b>General Threats</b>	<b>Specific Threats</b>	<b>General Conservation Actions</b>	<b>Specific Conservation Actions</b>	<b>Priority</b>
Lack of Information	Population status and trends unknown	Population Monitoring and Research	Determine population distribution and status	M

<b>Fringed Myotis</b>		<b>Biology and Life History</b>	<b>Population</b>	<b>Distribution</b>
<i>Myotis thysanodes</i> Tier II Mammal		Inhabits a wide range of habitats including desert scrub and fir stands. Specialize in beetle foraging. Often roosts in human habitations.	Apparently rare in Utah. 21 individuals recorded (Hasenyager 1980), species approx. 4% of captures. May be more common than originally thought or may be local effect. Population trend unknown.	Widely distributed in Utah. Specimens taken from 6 counties mostly in the southern and southeastern regions of the state.
<b>General Threats</b>	<b>Specific Threats</b>	<b>General Conservation Actions</b>	<b>Specific Conservation Actions</b>	<b>Priority</b>
Human Disturbance	Human disturbance to roosting sites and maternity colonies	Control and Monitor Disturbance	Limit human disturbance to roosting sites (particularly maternity colonies)	H
Lack of Information	Information needed on current population status, trend, and response to habitat alteration	Population Monitoring and Research	Determine current population status, trend, and response to modification of foraging areas in riparian zones	M
Habitat Loss	Destruction of riparian zones	Habitat Monitoring and Research	Determine current population status, trend, and response to modification of foraging areas in riparian zones	M

<b>Gray Wolf</b> <i>Canis lupis</i> Tier I Mammal		<b>Biology and Life History</b>	<b>Population</b>	<b>Distribution</b>
		Gray wolves typically travel and hunt in packs. They cover large areas while searching for prey, and prefer to consume large animals, such as deer and elk, but will also eat small mammals and carrion. The species can live in many types of habitat, but areas with little human activity are preferred. Gray wolves are primarily nocturnal, returning to underground dens during the day. In most cases, only the dominant male and female of each pack mate; the dominate female will typically produce one litter of four to ten pups in the spring of each year.	Currently extirpated but future recolonization is possible.	Historically distributed statewide. Currently extirpated.
<b>General Threats</b>	<b>Specific Threats</b>	<b>General Conservation Actions</b>	<b>Specific Conservation Actions</b>	<b>Priority</b>
Habitat Loss	Loss and fragmentation of wilderness and wilderness like habitat	Protect Significant Areas	Prioritize and protect remaining suitable habitat	H
Human Disturbance	Conflicts with domestic livestock	Control and Monitor Disturbance	Implement the state Wolf Management Plan	H

<b>Gunnison's Prairie-dog</b> <i>Cynomys gunnisoni</i> Tier II Mammal		<b>Biology and Life History</b>	<b>Population</b>	<b>Distribution</b>
		Found in open grassy and brushy areas of high mountain valleys and lower dry habitats associated with white-tailed prairie dogs.	Highly variable with habitat conditions. Populations decline under drought conditions and when forage is sparse, but are capable of rapid recovery when forage is adequate.	Range centered in the four corners area. In Utah, this species is found in San Juan county.
<b>General Threats</b>	<b>Specific Threats</b>	<b>General Conservation Actions</b>	<b>Specific Conservation Actions</b>	<b>Priority</b>
Disease	Outbreaks of sylvatic plague have decimated populations	Test and Monitor Disease	Determine long-term effects of plague on prairie dog colonies; monitor population status, trend, and survivorship	M
Environmental Contamination	Rodenticide and agricultural control measures negatively impact populations	Population Monitoring and Research	Determine effects of agricultural control, evaluate population response to change and determine factors limiting recovery	H
Habitat Loss	Loss and fragmentation of habitat due to energy development	Conserve suitable habitat, Protect Significant Areas, Habitat Monitoring and Research	Avoid direct impacts to colonies by providing appropriate buffers to against disturbance	H
Harvest	Recreational Shooting	Control and Monitor Disturbance, Education and Outreach, Population Monitoring and Research	Utilize shooting closures where appropriate	M
Energy Development	Habitat loss and fragmentation	Control and Monitor Disturbance	Avoid direct impacts to colonies by providing appropriate buffers to against the construction of well pads, roads and other structures	H

<div>Idaho Pocket Gopher</div> <div><i>Thomomys idahoensis</i></div> <div>Tier III</div> <div>Mammal</div>		Biology and Life History	Population		Distribution	
		Usually inhabits areas of shallow rocky soils at moderate to high elevations.	Eleven localities of occurrence known in Utah		Known only in Rich and Dagget Counties. Substantial amount of overall range is in Utah.	
General Threats	Specific Threats	General Conservation Actions		Specific Conservation Actions		Priority
Lack if Information	Threats are currently unknown	Population Monitoring and Research		Determine current population status		H

<b>Kit Fox</b> <i>Vulpes macrotis</i> Tier II <div>Mammal</div>		<b>Biology and Life History</b>	<b>Population</b>	<b>Distribution</b>	
		Primarily a Southwestern species, they inhabit deserts and semi-arid regions. Reported to be monogamous and may mate for life.	Population status largely unknown but may be declining. Increased distribution of water has limited species to suboptimal habitat (Adam Koslowski, pers. comm.).	Fairly widely distributed in the desert regions of Utah.	
<b>General Threats</b>	<b>Specific Threats</b>	<b>General Conservation Actions</b>	<b>Specific Conservation Actions</b> <div>Priority</div>		
Harvest	Indiscriminate trapping threatens this species	Control and Monitor Disturbance	Control trapping in areas of known occurrence; educate public on detrimental impacts of indiscriminate trapping on kit fox populations		
Environmental Contamination	Bioaccumulation of rodenticides	Population Monitoring and Research	Determine impact of rodenticide accumulation on Kit Fox populations		
Water Development	Exdpansion of coyotes and other competitors into kit fox habitat resulting artificial water sources	Population Monitoring and Research	Determine the extent and impacts of competition		

<b>Merriam's Shrew</b> <i>Sorex merriami</i> Tier III <div>Mammal</div>		<b>Biology and Life History</b>	<b>Population</b>		<b>Distribution</b>
		Typically prefers dry habitats, some association with vole colonies.	Nine specimens reported for Utah (Osgood 1909). Population trend unknown.		Presumed statewide. Confirmed in Beaver, San Juan, and Rich counties.
<b>General Threats</b>	<b>Specific Threats</b>	<b>General Conservation Actions</b>		<b>Specific Conservation Actions</b>	<b>Priority</b>
Lack of Information	Only nine specimens reported in Utah; presumed statewide but actual distribution unknown; overgrazing may be a potential threat	Population Monitoring and Research		Determine population distribution and status and response to grazing practices	M

<b>Mexican Vole</b> <i>Microtus mexicanus</i> Tier II <div>Mammal</div>		<b>Biology and Life History</b>	<b>Population</b>	<b>Distribution</b>	
		The race that occurs in Utah is nearly endemic to the state.	Population has apparently declined since the 1930s (Spicer 1987).	Occurs only on one mountain in extreme southwestern San Juan county near Arizona border.	
<b>General Threats</b>	<b>Specific Threats</b>	<b>General Conservation Actions</b>	<b>Specific Conservation Actions</b>		<b>Priority</b>
High Percent of Global Population	Occurs in only one mountain area in extreme southern San Juan County	Population Monitoring and Research	Determine current population status, trend, and distribution in Utah		H
Habitat Loss	Habitat degradation by heavy grazing of sheep in known area of occurrence threatens this species	Habitat Monitoring and Research	Determine effect of improper grazing on population status and survivorship		M

<b>Mule Deer</b>		<b>Biology and Life History</b>	<b>Population</b>	<b>Distribution</b>
<i>Odocoileus hemionus</i> Tier III Mammal		Mating occurs in late fall, and females may produce a litter of one or two fawns in late spring or early summer. Mule deer are browsers that primarily eat shrubs and other woody material, although grasses are also consumed.	Widespread throughout Utah in high numbers. Species has experienced recent declines.	Occurs in the western half of North America, from southeastern Alaska to Mexico. The species is common state-wide in Utah, where it can be found in many types of habitat, ranging from open deserts to high mountains to urban areas.
<b>General Threats</b>	<b>Specific Threats</b>	<b>General Conservation Actions</b>	<b>Specific Conservation Actions</b>	<b>Priority</b>
Lack of Information	Populations have experienced recent declines	Population Monitoring and Research	Determine population status and trend; explore possible reasons for decline	H
Habitat Loss	Loss of lower elevation winter range can devastate this species	Habitat Monitoring and Research	Protect and rehabilitate remaining low elevation habitat	H

<b>Northern Flying Squirrel</b>		<b>Biology and Life History</b>	<b>Population</b>	<b>Distribution</b>
<i>Glaucomys sabrinus</i> Tier III Mammal		Eat fungi and lichens, as well as nuts, seeds, insects, and fruits. Nests are usually constructed inside hollow trees, but are sometimes constructed on tree branches. The species is nocturnal and active throughout the year.	Fairly common. Population trend unknown but likely stable.	Widespread in the mountains of central Utah High Plateaus, Wasatch Mountains and Uinta Mountains; fairly common in some areas (Oliver 1997).
<b>General Threats</b>	<b>Specific Threats</b>	<b>General Conservation Actions</b>	<b>Specific Conservation Actions</b>	<b>Priority</b>
Lack of Information	Population status and trend unknown; response to logging and forest fires unknown	Population Monitoring and Research	Determine population status, trend, and response to disturbance	H

<b>Northern River Otter</b>		<b>Biology and Life History</b>	<b>Population</b>	<b>Distribution</b>
<i>Lontra canadensis</i> Tier III Mammal		Prefer bodies of water that have a diversity of shoreline habitats and suitable den sites.	Natural abundance very low, though reintroduction has increased population size. 58 records of otters during 1978-1988 (Bich 1988) Natural populations believed to be declining.	Possibly as many as 18 natural locations in the state including Grand, Box Elder, Wasatch and San Juan counties.
<b>General Threats</b>	<b>Specific Threats</b>	<b>General Conservation Actions</b>	<b>Specific Conservation Actions</b>	<b>Priority</b>
Water Development	Stream alteration and diversion of water for irrigation and agriculture	Control and Monitor Disturbance	Manage water diversion/alteration to minimize impacts to otters	H
Harvest	Inadvertent trapping, though collection of this species is regulated	Control and Monitor Disturbance	Determine effect of inadvertent trapping on populations	H

<b>Northern Rock Mouse</b>		<b>Biology and Life History</b>	<b>Population</b>	<b>Distribution</b>
<i>Peromyscus nasutus</i> Tier III Mammal		Found in brushy habitats within rock outcroppings.	Known in Utah from a single individual collected in 1930 at Rainbow Bridge. Population trend unknown.	Distribution largely unknown. One individual captured at Rainbow Bridge Inventory needed.
<b>General Threats</b>	<b>Specific Threats</b>	<b>General Conservation Actions</b>	<b>Specific Conservation Actions</b>	<b>Priority</b>
Lack of Information	Population status and distribution unknown	Population Monitoring and Research	Determine population distribution and status	M

<b>Olive-backed Pocket Mouse</b> <i>Perognathus fasciatus</i> Tier III Mammal		<b>Biology and Life History</b>	<b>Population</b>	<b>Distribution</b>
		Inhabits open country, often in sandy soil (Zeveloff 1988).	Two known localities (Hayward and Killpack 1956). Population trend unknown.	Barely enters the extreme northeast corner of Utah.
<b>General Threats</b>	<b>Specific Threats</b>	<b>General Conservation Actions</b>		<b>Specific Conservation Actions</b> <span>Priority</span>
Lack of Information	Population status and trend unknown	Population Monitoring and Research	Determine population status and trend	M

<b>Preble's Shrew</b> <i>Sorex preblei</i> Tier II Mammal		<b>Biology and Life History</b>	<b>Population</b>	<b>Distribution</b>
		Associated with wetland habitats.	Four specimens reported for Utah (Tomasi and Hoffmann 1984, Pritchett and Pederson 1993). Population trend unknown.	Known from two localities in Tooele County.
<b>General Threats</b>	<b>Specific Threats</b>	<b>General Conservation Actions</b>		<b>Specific Conservation Actions</b> <span>Priority</span>
Lack of Information	Information needed on current status of population in Utah	Population Monitoring and Research	Determine current population status and distribution in Utah	H
Habitat Loss	Degradation due to presence of livestock	Habitat Monitoring and Research	Determine the extent and effects livestock grazing on populations	L
Human Disturbance	Mosquito abatement	Population Monitoring and Research	Evaluate population responses to change	M
Environmental Contamination	Agricultural runoff	Habitat Monitoring and Research	Determine the extent and effects livestock grazing on populations	L

<b>Pygmy Rabbit</b> <i>Brachylagus idahoensis</i> Tier II Mammal		<b>Biology and Life History</b>	<b>Population</b>	<b>Distribution</b>
		Pygmy rabbits are largely dependent upon big sagebrush ( <i>A. tridentata</i> ) for both food and cover.	Population status is unknown, but it is likely that while current distribution is similar to historic range, abundance has decreased (Adam Koslowski, pers. comm.).	Almost the entire distribution of this species occurs within the intermountain west; a substantial portion in Utah.
<b>General Threats</b>	<b>Specific Threats</b>	<b>General Conservation Actions</b>		<b>Specific Conservation Actions</b> <span>Priority</span>
High Percent of Global Population	Substantial portion of population occurs in Utah	Population Monitoring and Research	Determine population status and distribution in Utah as well as habitat requirements and response to habitat alteration	H
Habitat Loss	Loss and/or deterioration of sagebrush habitat	Habitat Monitoring and Research	Determine the specific habitat requirements of the species and monitor population responses to habitat change or alteration	H
Lack of Information	Unknown population status	Population Monitoring and Research	Identify and fill information gaps and take the necessary steps to protect and expand suitable habitat	H
Lack of information	Unknown population distribution	Determine and Map Distribution	Identify and fill information gaps and take the necessary steps to protect and expand suitable habitat	H

<b>Silky Pocket Mouse</b>		<b>Biology and Life History</b>	<b>Population</b>	<b>Distribution</b>
<i>Perognathus flavus</i> Tier II Mammal		Presence of grassy cover important for this species (Best and Skupski 1994).	Very rare. Five localities in Utah and 16 total specimens have been reported (Durrant 1952). Population trend unknown.	Southeast corner of Utah in San Juan County.
<b>General Threats</b>	<b>Specific Threats</b>	<b>General Conservation Actions</b>	<b>Specific Conservation Actions</b>	<b>Priority</b>
Lack of Information	Information needed on current population status and trends in Utah	Population Monitoring and Research	Determine current population status and distribution in Utah	H

<b>Spotted Bat</b>		<b>Biology and Life History</b>	<b>Population</b>	<b>Distribution</b>
<i>Euderma maculatum</i> Tier II Mammal		A relatively solitary species, but may roost in small groups. Found in a variety of habitats.	Thought to be rare but detailed information on population size lacking. May be less prone to mist netting than other species (.02-4.5% of captures).	Fairly widely distributed throughout the intermountain west. May be distributed statewide but records from western and northern Utah missing.
<b>General Threats</b>	<b>Specific Threats</b>	<b>General Conservation Actions</b>	<b>Specific Conservation Actions</b>	<b>Priority</b>
Environmental Contamination	Use of pesticides to control Mormon crickets and grasshoppers may adversely affect prey base	Evaluate Population Responses to change	Determine impact of pesticide usage on population	H
Human Disturbance	Recreational rock climbing may affect species on a local level	Control and Monitor Disturbance	Determine impact of recreation on population	H
Harvest	Bats are susceptible to injury during population monitoring using mist nets	Control and Monitor Disturbance	Determine impact of monitoring practices on population	H
Human Disturbance	Increased risk of predation to bats released diurnally by researchers	Control and Monitor Disturbance	Regulate research protocols for this species	H

<b>Spotted Ground Squirrel</b>		<b>Biology and Life History</b>	<b>Population</b>	<b>Distribution</b>
<i>Spermophilus spilosoma</i> Tier III Mammal		High-desert species. Occurs in dry, sandy soils and sparse shrubby vegetation.	Rare in Utah. Only 1 specimen examined.	Known from 3 localities all in San Juan county.
<b>General Threats</b>	<b>Specific Threats</b>	<b>General Conservation Actions</b>	<b>Specific Conservation Actions</b>	<b>Priority</b>
Lack of Information	Population status unknown; only one specimen examined in Utah	Population Monitoring and Research	Determine current population status, distribution, and trend	M

<b>Stephens' Woodrat</b>		<b>Biology and Life History</b>	<b>Population</b>	<b>Distribution</b>
<i>Neotoma stephensi</i> Tier III Mammal		Associated with rock piles in Pinyon-juniper habitat.	Abundance probably low in Utah, only six individuals collected in the state.	Barely enters San Juan county near the Arizona border. Overall distribution in S.W. United States small.
<b>General Threats</b>	<b>Specific Threats</b>	<b>General Conservation Actions</b>	<b>Specific Conservation Actions</b>	<b>Priority</b>
Limited Distribution	Global distribution is small for a North American mammal	Population Monitoring and Research	Determine population status, productivity, and survival	H



<div>Thirteen-lined Ground Squirrel</div> <div><i>Spermophilus tridecemlineatus</i></div> <div>Tier III</div> <div>Mammal</div>	Biology and Life History	Population		Distribution		
	Often occurs in grasslands with well-drained soil.	13 possible specimens for the state. Anecdotal evidence suggest significant population decline.		Occurs in the Uintah Basin in Uintah and Duchesne counties.		
General Threats	Specific Threats	General Conservation Actions	Specific Conservation Actions			Priority
Lack of Information	Information needed on population status and trend	Population Monitoring and Research	Determine current population status and trend			H

<div>Townsend's Big-eared Bat</div> <div><i>Plecotus townsendii</i></div> <div>Tier II</div> <div>Mammal</div>		Biology and Life History	Population	Distribution		
		Often found in scrub communities and pinyon-juniper habitats. Maternity colonies are located in the warmer portions of mines, caves, and buildings.	Moderately common. Specimens may exceed 100. Thought to be declining (George Oliver, pers. comm.).	Occurs statewide. Recorded in 19 counties (Hasenyager 1980).		
General Threats	Specific Threats	General Conservation Actions	Specific Conservation Actions			Priority
Human Disturbance	Particularly sensitive to human disturbance, especially maternity colonies	Control and Monitor Disturbance	Limit and control disturbance at know roosting sites particularly at maternity colonies			H
Habitat Loss	Adversely affected by mine closures	Restore Degraded Habitats	Determine impact of mine closures on population; employ current recommendations for mine closure including survey and construction of bat gates			H
Lack of Information	Ongoing taxonomic debate about appropriate genus name	Population Monitoring and Research	Determine taxonomy through genetic research			M

<div>Utah Prairie-dog</div> <div><i>Cynomys parvidens</i></div> <div>Tier I</div> <div>Mammal</div>	<b>Biology and Life History</b>	<b>Population</b>	<b>Distribution</b>	
	Utah prairie-dogs form colonies and spend much of their time in underground burrows, often hibernating during the winter. The species breeds in the spring, and young can be seen above ground in late May or early June. The Utah prairie-dog's diet is composed of flowers, seeds, grasses, leaves, and even insects.	This species is rare. Endemic to Utah.	Found in Iron, Garfield, Piute and Wayne Counties.	
<b>General Threats</b>	<b>Specific Threats</b>	<b>General Conservation Actions</b>	<b>Specific Conservation Actions</b>	<b>Priority</b>
Disease	Outbreaks of sylvatic plague have decimated populations	Test and Monitor Disease	Determine long-term effects of plague on prairie dog colonies; monitor population status, trend, and survivorship	H
Habitat Loss	Urban development	Protect Significant Areas	Avoid direct impacts to colonies by providing appropriate buffers against disturbance; establish populations on public land through translocation	H
Energy Development	Construction for energy development threatens habitat	Control and Monitor Disturbance	Avoid direct impacts to colonies by providing appropriate buffers against the construction of well pads, roads and other structures	M
High Percent of Global Population	Endemic to Utah	Population Monitoring and Research	Establish populations on public land through translocation	H

<b>Western Red Bat</b> <i>Lasiurus blossevillii</i> Tier II Mammal		<b>Biology and Life History</b>	<b>Population</b>	<b>Distribution</b>
		Roost in deciduous trees, usually those with large broad leaves.	Rarest bat in Utah, only fourteen specimens recorded. Population trend unknown.	Most specimens recorded in Washington County except one occurrence in Carbon County and verbal reports in north-central Utah.
<b>General Threats</b>	<b>Specific Threats</b>	<b>General Conservation Actions</b>	<b>Specific Conservation Actions</b>	<b>Priority</b>
Human Disturbance	Sensitive to human disturbance to caves and mines; though these are not thought to be primary roost sites for the species	Control and Monitor Disturbance	Limit and control disturbance at known roosting sites particularly at maternity colonies	M
Lack of Information	Information needed on the impact of riparian modification/degradation on population	Protect Significant Areas	Determine impact of riparian destruction and degradation on prey base availability and population status	H
Lack of information	Ongoing taxonomic debate, still considered by some to be conspecific with similar species	Population Monitoring and Research	Determine behavioral, physiological, and genetic differences between species	H

<b>White-tailed Prairie-dog</b> <i>Cynomys leucurus</i> Tier II Mammal		<b>Biology and Life History</b>	<b>Population</b>	<b>Distribution</b>
		Occupies lower dry habitats. Colonies spend much of their time in underground burrows, often hibernating during the winter. The species breeds in the spring, and young can be seen above ground in early June. The white-tailed prairie-dog's diet is composed of grasses and bulbs. In turn, the white-tailed prairie-dog is the main food source of the Utah population of the endangered black-footed ferret.	Highly variable with habitat conditions. Populations decline under drought conditions and when forage is sparse, but are capable of rapid recovery when forage is adequate.	Occurs in the northeastern part of the state. The species is also found in parts of Colorado, Wyoming, and Montana.
<b>General Threats</b>	<b>Specific Threats</b>	<b>General Conservation Actions</b>	<b>Specific Conservation Actions</b>	<b>Priority</b>
Disease	Outbreaks of sylvatic plague have decimated populations	Test and Monitor Disease	Determine long-term effects of plague on prairie dog colonies; monitor population status, trend, and survivorship	H
Environmental Contamination	Rodenticide and agricultural control measures negatively impact populations	Population Monitoring and Research	Determine effects of agricultural control, determine factors limiting recovery	H
Habitat Loss	habitat loss and fragmentation resulting from energy development and urban development	Conserve suitable habitat, Protect Significant Areas, Habitat Monitoring and Research	Avoid direct impacts to colonies by providing appropriate buffers to against disturbance	H
Harvest	Recreational shooting	Control and Monitor Disturbance, Education and Outreach, Population Monitoring and Research	Utilize shooting closures where appropriate	M
Energy Development	Habitat loss and fragmentation	Control and Monitor Disturbance	Avoid direct impacts to colonies by providing appropriate buffers to against the construction of well pads, roads and other structures	H

<b>Wolverine</b>		<b>Biology and Life History</b>	<b>Population</b>	<b>Distribution</b>
<i>Gulo gulo</i> Tier III Mammal		Females are believed to be monestrous and, in the wild, breed from May to August. Wolverines exhibit delayed implantation with females giving birth before late March.	Possibly extirpated from Utah. Recent sightings suggest may still be extant in the state.	May still be present in parts of the Wasatch and Uinta mountains as well as mountains in Sanpete county.
<b>General Threats</b>	<b>Specific Threats</b>	<b>General Conservation Actions</b>	<b>Specific Conservation Actions</b>	<b>Priority</b>
Lack of Information	Species possibly extirpated from state; current status unknown	Population Monitoring and Research	Survey habitat to determine current population status in Utah	H
Development	Habitat alteration due to road construction	Habitat Monitoring and Research	Survey habitat to determine current population status in Utah	M

<b>Wyoming Ground Squirrel</b>		<b>Biology and Life History</b>	<b>Population</b>	<b>Distribution</b>
<i>Spermophilus elegans</i> Tier III Mammal		Occupies greasewood sagebrush habitat (Hansen 1953).	6 localities reported for Utah (Hansen 1953). Population trend unknown, anecdotally reported as declining.	Known only from areas along the Wyoming border.
<b>General Threats</b>	<b>Specific Threats</b>	<b>General Conservation Actions</b>	<b>Specific Conservation Actions</b>	<b>Priority</b>
Lack of Information	Population trends and status are unknown;	Population Monitoring and Research	Determine population status and trend	M
Disease	Adversely affected by plague	Test and Monitor Disease	Determine effects of plague on survivorship	M
Environmental Contamination	Poisoned in some areas	Determine and Address Factors Limiting Recovery	Determine effects of poisoning on population	M
Habitat Loss	Degradation and destruction of shrubsteppe habitat	Habitat Monitoring and Research	Determine population status and trend and habitat requirements	M

<b>Yuma Myotis</b>		<b>Biology and Life History</b>	<b>Population</b>	<b>Distribution</b>
<i>Myotis yumaensis</i> Tier III Mammal		Forage near waterways. Females roost in large nursery colonies found in caves and tunnels.	Uncommon in Utah, though may be more abundant in southern regions of the state (Oliver 2000). Hardy (1941) ranked this the second rarest species in Utah. Other rankings have been much more variable (Oliver 2000).	Occurs throughout most of the state. Has not been collected in the northwest corner of the state or in the northernmost part of north-central Utah (Oliver 2000).
<b>General Threats</b>	<b>Specific Threats</b>	<b>General Conservation Actions</b>	<b>Specific Conservation Actions</b>	<b>Priority</b>
Human Disturbance	Direct human disturbance of nursery colonies, mine closures, pest control activities, and overgrazing	Control and Monitor Disturbance	Determine effects of human disturbance on colonies, survey mines prior to gating (using bat gates where possible), manage grazing in riparian areas	H
Hybridization	Reported hybridization with closely related species in western North America	Population Monitoring and Research	Determine extent of hybridization and impacts on population	H

**Mollusks**

<b>Bear Lake Springsnail</b>		<b>Biology and Life History</b>	<b>Population</b>	<b>Distribution</b>
<i>Pyrgulopsis pilsbryana</i> Tier II Mollusk		Found in springs and associated waters.	Believed common in Utah, though of limited distribution.	Bear Lake Basin, extreme north-central Utah.
<b>General Threats</b>	<b>Specific Threats</b>	<b>General Conservation Actions</b>	<b>Specific Conservation Actions</b>	<b>Priority</b>
Limited Distribution	3 known populations today	Population Monitoring and Research	Determine population status and trends	H
Human Disturbance	May be affected by overgrazing and irrigation practices	Restore Degraded Habitat	Remove agricultural water downstream of species' habitat	H
Habitat Loss	Habitat degradation	Conserve Suitable Habitat	Provide enclosures	H

<b>Bifid Duct Pyrg</b>		<b>Biology and Life History</b>	<b>Population</b>	<b>Distribution</b>
<i>Pyrgulopsis peculiaris</i> Tier II Mollusk		Spring obligate species.	Population size and trends unknown.	Found only in Millard County.
<b>General Threats</b>	<b>Specific Threats</b>	<b>General Conservation Actions</b>	<b>Specific Conservation Actions</b>	<b>Priority</b>
Limited Distribution	6 known populations today	Population Monitoring and Research	Determine population status and trends	H
Human Disturbance	Affected by overgrazing and irrigation practices	Restore Degraded Habitat	Remove agricultural water downstream of habitat	H
Habitat Loss	Habitat degradation	Conserve Suitable Habitat	Provide enclosures	H

<b>Black Canyon Pyrg</b>		<b>Biology and Life History</b>	<b>Population</b>	<b>Distribution</b>
<i>Pyrgulopsis plicata</i> Tier II Mollusk		Occurs in small flowering springs flowing from a steep hillside.	Species believed rare in Utah.	Black Canyon in Garfield County.
<b>General Threats</b>	<b>Specific Threats</b>	<b>General Conservation Actions</b>	<b>Specific Conservation Actions</b>	<b>Priority</b>
Limited Distribution	Known from one location only	Population Monitoring and Research	Determine population status and trends	H
High Percent of Global Population	Known from one location only	Determine and Map Distribution	Expand search for additional populations	L
Habitat Loss	Agricultural practices, especially improper grazing, may negatively affect	Conserve Suitable Habitat	Provide enclosures	H

<b>Black Gloss</b> <i>Zonitoides nitidus</i> Tier III Mollusk		<b>Biology and Life History</b>	<b>Population</b>	<b>Distribution</b>	
		Occurs on the moist banks of streams at the water's edge.	Populations are reportedly small and localized. Occurs in the north-central part of the state. Population trend is unknown.	Literature reports occurrences in 6 locations in the Wasatch Mountains in 5 counties, Cache, Weber, Summit, Salt Lake and Utah. Current information is needed as last reports of population were from 1942.	
<b>General Threats</b>	<b>Specific Threats</b>	<b>General Conservation Actions</b>		<b>Specific Conservation Actions</b>	<b>Priority</b>
Lack of Information	Referenced in literature but current populations unknown	Population Monitoring and Research		Survey to determine if extant; determine population status and trends	H
Habitat Loss	Human activities, especially improper agricultural practices, may negatively affect habitat	Conserve Suitable Habitat		Determine if populations are at risk and protect habitat as necessary	H

<b>Brian Head Mountainsnail</b> <i>Oreohelix parawanensis</i> Tier II Mollusk		<b>Biology and Life History</b>	<b>Population</b>	<b>Distribution</b>	
		Occurs at high elevations near the tree line.	Population size and trends unknown.	Iron County.	
<b>General Threats</b>	<b>Specific Threats</b>	<b>General Conservation Actions</b>		<b>Specific Conservation Actions</b>	<b>Priority</b>
Limited Distribution	Known from one location only	Population Monitoring and Research		Determine population status and trends	H
High Percent of Global Population	Known from one location only	Determine and Map Distribution		Expand search for additional populations	L
Habitat Loss	Destruction or alteration of habitat by overgrazing	Conserve Suitable Habitat		Provide enclosures	H

<b>California Floater</b> <i>Anodonta californiensis</i> Tier II Mollusk		<b>Biology and Life History</b>	<b>Population</b>	<b>Distribution</b>	
		Found in lakes and ponds.	Known populations are very small.	Bonneville Basin.	
<b>General Threats</b>	<b>Specific Threats</b>	<b>General Conservation Actions</b>		<b>Specific Conservation Actions</b>	<b>Priority</b>
Lack of Information	Extent of distribution unknown	Determine and Map Distribution		Identify conservation populations; determine population status and trends	H
Lack of Information	Ongoing taxonomic debate; there may be two or more distinct species in Utah	Population Monitoring and Research		Study by qualified investigator needed to clarify taxonomy	H
Human Disturbance	Water withdrawals, agricultural practices	Protect significant areas		Provide enclosures	H
Invasive Animal Species	Specific fish hosts may be required; invasive species may interfere with reproduction	Population Monitoring and Research		Monitor productivity in areas with introduced species; research host specificity requirements	H
Habitat Loss	Habitat degradation	Conserve Suitable Habitat		Provide enclosures	H
Hybridization	Loss of genetic diversity due to inbreeding	Population Monitoring and Research		Determine extent of hybridization and degree of threat to existing population	M

<b>Carinate Glenwood Pyrg</b> <i>Pyrgulopsis inopinata</i> Tier II Mollusk		<b>Biology and Life History</b>	<b>Population</b>	<b>Distribution</b>
		Found in spring habitats.	Population size and trends unknown.	Sevier County.
<b>General Threats</b>	<b>Specific Threats</b>	<b>General Conservation Actions</b>	<b>Specific Conservation Actions</b>	<b>Priority</b>
Limited Distribution	2 known populations today	Population Monitoring and Research	Determine population status and trends	H
Human Disturbance	Habitat degradation due to recreation	Protect Significant Areas	Provide enclosures	H

<b>Cloaked Physa</b> <i>Physa megalochlamys</i> Tier II Mollusk		<b>Biology and Life History</b>	<b>Population</b>	<b>Distribution</b>
		Occurs in marshland habitats and ponds.	Population size and trends unknown.	Snake Valley in northwestern Millard County.
<b>General Threats</b>	<b>Specific Threats</b>	<b>General Conservation Actions</b>	<b>Specific Conservation Actions</b>	<b>Priority</b>
Limited Distribution	Known from one location only	Population Monitoring and Research	Determine population status and trends	H
Habitat Loss	Habitat degradation	Conserve Suitable Habitat	Provide enclosures	H

<b>Creeping Ancyld</b> <i>Ferrissia rivularis</i> Tier III Mollusk		<b>Biology and Life History</b>	<b>Population</b>	<b>Distribution</b>
		Collections of dead specimens suggest that they occur in spring-fed marshes, rivers and a somewhat saline freshwater lake, but no specific habitat data on live specimens has been reported.	Five known occurrences of this species in the north-central and west-central parts of the state. Believed to be very uncommon in the state.	Occurs in Utah, Morgan, Juab and Millard Counties. Limited information is available. More information is needed to determine current status and distribution of this species in the state.
<b>General Threats</b>	<b>Specific Threats</b>	<b>General Conservation Actions</b>	<b>Specific Conservation Actions</b>	<b>Priority</b>
Lack of Information	Referenced in literature but current populations unknown	Population Monitoring and Research	Determine population status and trends	H
Habitat Loss	Marsh habitat threatened by draining and burning	Conserve Suitable Habitat	Protect identified populations with enclosures or other means	H

<b>Cross Snaggletooth</b> <i>Gastrocopta quadridens</i> Tier III Mollusk		<b>Biology and Life History</b>	<b>Population</b>	<b>Distribution</b>
		No habitat information has been reported due to difficulty in detecting live specimens. Two historical occurrences were noted at high elevations.	Two historical occurrences from north-central and south-central Utah. Population trend and abundance are unknown. There have been no surveys for this species since the early 1930s.	Species found at Fish Lake, Sevier County and in Lamb's Canyon, Salt Lake County. More information is needed to determine current status and distribution of this species in the state.
<b>General Threats</b>	<b>Specific Threats</b>	<b>General Conservation Actions</b>	<b>Specific Conservation Actions</b>	<b>Priority</b>
Lack of Information	Referenced in literature but current populations unknown	Determine and Map Distribution	Survey to determine if extant	H

<b>Deseret Mountainsnail</b>		<b>Biology and Life History</b>	<b>Population</b>	<b>Distribution</b>	
<i>Oreohelix peripherica</i> Tier II Mollusk		Associated with limestone outcrops or other soils with high calcium concentrations.	13 colonies reported in Utah.	Box Elder, Cache and Weber Counties.	
<b>General Threats</b>	<b>Specific Threats</b>	<b>General Conservation Actions</b>	<b>Specific Conservation Actions</b>	<b>Priority</b>	
Limited Distribution	Known from only 13 locations	Population Monitoring and Research	Determine population status and trends	H	
Lack of Information	Ongoing taxonomic debate; populations may include subspecies	Population Monitoring and Research	Study by qualified investigator needed to clarify taxonomy	M	
Habitat Loss	Habitat alteration due to forest fires	Protect Significant Areas	Provide enclosures	H	

<b>Desert Springsnail</b>		<b>Biology and Life History</b>	<b>Population</b>	<b>Distribution</b>	
<i>Pyrgulopsis deserta</i> Tier II Mollusk		Spring obligate species.	Population size and trends unknown.	Virgin River Basin and Washington County.	
<b>General Threats</b>	<b>Specific Threats</b>	<b>General Conservation Actions</b>	<b>Specific Conservation Actions</b>	<b>Priority</b>	
Limited Distribution	6 known populations today	Population Monitoring and Research	Determine population status and trends	H	
Lack of Information	Distribution not well known	Determine and Map Distribution	Expand search for additional populations	L	
Habitat Loss	Habitat degradation	Conserve Suitable Habitat	Provide enclosures	H	

<b>Eureka Mountainsnail</b>		<b>Biology and Life History</b>	<b>Population</b>	<b>Distribution</b>	
<i>Oreohelix eurekaensis</i> Tier II Mollusk		Found in shrubland and forested habitats.	4 known populations in Utah.	western portion of Tooele & Juab counties and in northern Grand County.	
<b>General Threats</b>	<b>Specific Threats</b>	<b>General Conservation Actions</b>	<b>Specific Conservation Actions</b>	<b>Priority</b>	
Human Disturbance	Affected by improper grazing and potentially by timber harvest	Protect Significant Areas	Provide enclosures	H	
Limited Distribution	Only one site known with few individuals	Population Monitoring and Research	Determine population status and trends	H	
Habitat Loss	Destruction or alteration of habitat due to mining activities and forest fires	Conserve Suitable Habitat	Provide enclosures	H	

<b>Fat-whorled pondsnail</b> <i>Stagnicola bonnevillensis</i> Tier I Mollusk		<b>Biology and Life History</b>	<b>Population</b>	<b>Distribution</b>
		Found in freshwater spring outflows. Most habitats are warm, with fairly constant year-round temperatures. Reproduce sexually and asexually.	Not well known, but current population appears stable. Many shells of dead snail present in habitats, but not known if this is natural or from other causes.	Limited to five springs within one mile of each other in wetlands north of the Great Salt Lake. As currently described, this is the global distribution.
<b>General Threats</b>	<b>Specific Threats</b>	<b>General Conservation Actions</b>	<b>Specific Conservation Actions</b>	<b>Priority</b>
Environmental Contamination	Plumes of perchlorate and trichlorethylene	Control and Monitor Contaminants	Work with UDEQ and facility owner to control and remediate groundwater as described in conservation plan	H
High Percentage of Global Population	As currently described, global distribution found in fire small spring pools in close proximity.	Protect Significant Areas	Erect fencing or other barriers to exclude cattle from existing habitats	M
Lack of Information	Ongoing taxonomic debate.	Population Monitoring and Research	Conduct taxonomy genetic research	H

<b>Glass Physa</b> <i>Physa skinneri</i> Tier III Mollusk		<b>Biology and Life History</b>	<b>Population</b>	<b>Distribution</b>
		Found in shallow bodies of water such as ponds, swales, sloughs, and backwaters along streams.	Seven historical occurrences noted, mainly from north-central Utah with 2 localities in the south-central part of the state. There is no current information on population trends or abundance.	Reported to occur in Rich, Davis, Salt Lake, extreme western Summit and Sevier Counties.
<b>General Threats</b>	<b>Specific Threats</b>	<b>General Conservation Actions</b>	<b>Specific Conservation Actions</b>	<b>Priority</b>
Limited Distribution	7 sites recorded	Population Monitoring and Research	Survey historic sites to confirm presence; determine population status and trends	H
Human Disturbance	Urban expansion close to known locations	Protect Significant Areas	Provide enclosures	H

<b>Glossy Valvata</b> <i>Valvata humeralis</i> Tier III Mollusk		<b>Biology and Life History</b>	<b>Population</b>	<b>Distribution</b>
		Occurs in ditches, springs outflows and spring source pools at Fish Springs National WMA. Also occurs in several lakes and one reservoir in Utah.	At least 12 reported occurrences from 8 counties in central and western Utah. In 4 individual collections between 1929 and 1986, stable populations were indicated, but these locations have not been sampled since the original surveys.	Known to occur in Kane, Sevier, Utah, Wasatch, Rich and Box Elder Counties and Tooele County. Most recently reported in Fish Springs National Wildlife Refuge in Juab County.
<b>General Threats</b>	<b>Specific Threats</b>	<b>General Conservation Actions</b>	<b>Specific Conservation Actions</b>	<b>Priority</b>
Limited Distribution	Known from limited number of sites	Population Monitoring and Research	Survey known sites to confirm presence and determine population monitoring and trends	H
Water Development	Increases in water demands could negatively affect	Protect Significant Areas	Provide alternative water delivery systems, if needed	M

<b>Hamlin Valley Pyrg</b> <i>Pyrgulopsis hamlinensis</i> Tier II Mollusk		<b>Biology and Life History</b>	<b>Population</b>	<b>Distribution</b>
		Occurs in habitats produced by outflow of small springs.	Population size and trends unknown.	western Beaver County
<b>General Threats</b>	<b>Specific Threats</b>	<b>General Conservation Actions</b>	<b>Specific Conservation Actions</b>	<b>Priority</b>
Limited Distribution	Known from one location only	Population Monitoring and Research	Determine population status and trends	H
Human Disturbance	Habitat degradation due to overgrazing by livestock	Protect Significant Areas	Provide enclosures	H



<b>Kanab ambersnail</b> <i>Oxyloma hadeni kanabeusis</i> Tier I Mollusk		<b>Biology and Life History</b>	<b>Population</b>	<b>Distribution</b>
		Restricted to wet terrestrial habitats. Males and females mate to produce masses of about 12 eggs deposited on plants. Currently described as distributed in Utah and Arizona, but taxonomy of all population is being researched.	Limited numbers of individuals in one Utah location. As currently described, some limited populations in Arizona are being translocated to expand population sizes.	In Utah found only in Kane County from one location (Three Lakes). As currently described, populations of this species exist in the Grand Canyon.
<b>General Threats</b>	<b>Specific Threats</b>	<b>General Conservation Actions</b>	<b>Specific Conservation Actions</b>	<b>Priority</b>
Limited Distribution	Known from one Utah location	Protect Significant locations	Work with landowners to protect habitat from development and dewatering	H
Lack of Information	Taxonomic uncertainty. Don't know if all populations are same species	Implement Existing Conservation Plan (Kanab Ambersnail Recovery Plan)	Continue to support ongoing taxonomic (genetic) research	H
Development	Bridge expansion proposed near habitat	Control and Monitor disturbance	Work with UDOT and landowner to protect populations. Monitor at least annually	H

<b>Longitudinal Gland Pyrg</b> <i>Pyrgulopsis anguina</i> Tier II Mollusk		<b>Biology and Life History</b>	<b>Population</b>	<b>Distribution</b>
		Found in warm flowing springs.	Population size and trends unknown.	Northwestern Millard County.
<b>General Threats</b>	<b>Specific Threats</b>	<b>General Conservation Actions</b>	<b>Specific Conservation Actions</b>	<b>Priority</b>
Limited Distribution	2 known populations today	Population Monitoring and Research	Determine population status and trends	H
Human Disturbance	Affected by grazing and irrigation practices	Protect Significant Areas	Provide enclosures	H

<b>Lyrate Mountainsnail</b> <i>Oreohelix haydeni</i> Tier II Mollusk		<b>Biology and Life History</b>	<b>Population</b>	<b>Distribution</b>
		Associated with limestone outcrops or other soils with high calcium concentrations.	21 colonies reported in Utah.	Cache, Rich, Weber, Morgan, Salt Lake and Tooele counties.
<b>General Threats</b>	<b>Specific Threats</b>	<b>General Conservation Actions</b>	<b>Specific Conservation Actions</b>	<b>Priority</b>
Human Disturbance	Habitat degradation due to improper grazing and mining practices	Protect Significant Areas	Provide enclosures for identified colonies protecting suitable habitat	H
Lack of information	Populations' status not well known	Population Monitoring and Research	Determine population status and trends	H

<b>Mill Creek Mountainsnail</b> <i>Oreohelix howardi</i> Tier III Mollusk		<b>Biology and Life History</b>	<b>Population</b>	<b>Distribution</b>
		Found only on north-facing slopes within moist coniferous forests.	Three occurrences noted. In Utah, species is common and populations are stable.	Noted to only occur in Mill Creek Canyon, Salt Lake County. Proximity to large urban population increases risk of human disturbance to population.
<b>General Threats</b>	<b>Specific Threats</b>	<b>General Conservation Actions</b>	<b>Specific Conservation Actions</b>	<b>Priority</b>
Limited Distribution	Found only in Mill Creek Canyon	Protect Significant Areas	Provide enclosures	H
Human Disturbance	Recreation	Protect Significant Areas	Provide enclosures	H
Lack of Information	Ongoing taxonomic debate; may be distinct populations	Population Monitoring and Research	Study by qualified investigator needed to clarify taxonomy	H

<b>Montane Snaggletooth</b>		<b>Biology and Life History</b>	<b>Population</b>	<b>Distribution</b>
<i>Gastrocopta pilsbryana</i> Tier III Mollusk		No specific habitat data from live specimens has been recorded. One empty shell was found in 1929 in Cedar Canyon, on the south side near a tributary stream that had high banks.	Only two known occurrences of this species in southern Utah. Species believed to be rare, but perhaps only because there have been no reports since 1929.	Specimens reported from Garfield and Iron Counties.
<b>General Threats</b>	<b>Specific Threats</b>	<b>General Conservation Actions</b>	<b>Specific Conservation Actions</b>	<b>Priority</b>
Lack of Information	Referenced in literature but current populations unknown	Determine and Map Distribution	Survey to determine if extant	H

<b>Ninemile Pyrg</b>		<b>Biology and Life History</b>	<b>Population</b>	<b>Distribution</b>
<i>Pyrgulopsis nonaria</i> Tier II Mollusk		Occurs in spring habitats.	Population size and trends unknown.	Ninemile Reservoir in Sanpete County.
<b>General Threats</b>	<b>Specific Threats</b>	<b>General Conservation Actions</b>	<b>Specific Conservation Actions</b>	<b>Priority</b>
Limited Distribution	2 known populations today	Population Monitoring and Research	Determine population status and trends	H
Human Disturbance	Reservoir may have inundated population	Determine and Map Distribution	Expand search for additional populations	M
Habitat Loss	Habitat degradation	Conserve Suitable Habitat	Enclose habitat of existing colonies	H

<b>Northwest Bonneville Pyrg</b>		<b>Biology and Life History</b>	<b>Population</b>	<b>Distribution</b>
<i>Pyrgulopsis variegata</i> Tier II Mollusk		Found in habitats produced by springs.	Species is believed common in Utah.	Occurs in western Box Elder County.
<b>General Threats</b>	<b>Specific Threats</b>	<b>General Conservation Actions</b>	<b>Specific Conservation Actions</b>	<b>Priority</b>
Limited Distribution	8 known populations today	Determine and Map Distribution	Determine distributional extent	M
Habitat Loss	Habitat degradation	Protect Significant Areas	Provide enclosures and maintain water in known habitats	H
Lack of Information	Population status and trends not well documented	Population Monitoring and Research	Determine population status and trends	M

<b>Otter Creek Pyrg</b>		<b>Biology and Life History</b>	<b>Population</b>	<b>Distribution</b>
<i>Pyrgulopsis fusca</i> Tier II Mollusk		Associated with habitats produced by outflow of springs.	Population size and trend unknown.	Piute and Sevier Counties.
<b>General Threats</b>	<b>Specific Threats</b>	<b>General Conservation Actions</b>	<b>Specific Conservation Actions</b>	<b>Priority</b>
Limited Distribution	3 known populations today	Protect Significant Areas	Provide enclosures	H
Human Disturbance	Affected by overgrazing and irrigation practices	Restore Degraded Habitats	Remove agricultural water downstream of habitat	H
Habitat Loss	Habitat degradation	Conserve Suitable Habitat	Provide enclosures	H
Lack of Information	Population status and trends not well documented	Population Monitoring and Research	Determine population status and trends	H

<b>Ovate Vertigo</b>		<b>Biology and Life History</b>	<b>Population</b>	<b>Distribution</b>
<i>Vertigo ovata</i> Tier III Mollusk		One noted occurrence in Utah; no habitat information listed.	One historical report. Actual abundance is unknown. However, since this species is small and easily overlooked, population numbers are hard to determine.	Reported to occur in Fruita, Wayne County.
<b>General Threats</b>	<b>Specific Threats</b>	<b>General Conservation Actions</b>	<b>Specific Conservation Actions</b>	<b>Priority</b>
Lack of Information	Referenced in literature but current populations unknown	Determine and Map Distribution	Survey to determine if extant	H

<b>Ribbed Dagger</b>		<b>Biology and Life History</b>	<b>Population</b>	<b>Distribution</b>
<i>Pupoides hordaceus</i> Tier III Mollusk		None of the historical reports in Utah provide species habitat. Throughout species range, it is noted to occur in arid plateaus and foothills. Species is known to be small and difficult to sample.	Three noted historical occurrences. Limited information is known of species occurrence in Utah.	Noted to occur in Garfield County with one record in both Wayne and Garfield Counties. More research is needed to determine if species occurs elsewhere in southern Utah.
<b>General Threats</b>	<b>Specific Threats</b>	<b>General Conservation Actions</b>	<b>Specific Conservation Actions</b>	<b>Priority</b>
Lack of Information	Referenced in literature but current populations unknown	Determine and Map Distribution	Survey to determine if extant	H

<b>Rocky Mountain Dusksnail</b>		<b>Biology and Life History</b>	<b>Population</b>	<b>Distribution</b>
<i>Colligyrus greggi</i> Tier III Mollusk		Inhabits rheocrenes, springs flowing from the ground as streams.	Species only recently discovered in Utah. Noted to commonly occur in only two springs in northern Utah. Population trend unknown.	Only occurs in two springs in Cache County. More information is needed to determine if species is present in other springs in northern Utah.
<b>General Threats</b>	<b>Specific Threats</b>	<b>General Conservation Actions</b>	<b>Specific Conservation Actions</b>	<b>Priority</b>
Human Disturbance	Recreation	Protect Significant Areas	Provide enclosures	H
Lack of Information	Population status and trends unknown	Population Monitoring and Research	Determine population status and trends	H

<b>Sharp Sprite</b>		<b>Biology and Life History</b>	<b>Population</b>	<b>Distribution</b>
<i>Promenetus exacuus</i> Tier III Mollusk		Mostly found in lakes with one individual reportedly found in a reservoir.	Seven historical occurrences in north-central Utah with one noted in south-central Utah. Noted to be rare. Population is in decline as evidenced by its extirpation from Utah Lake.	Reported to occur in Cache, Weber, Davis, Salt Lake, extreme western Summit and Utah Counties with one noted occurrence in Sevier County.
<b>General Threats</b>	<b>Specific Threats</b>	<b>General Conservation Actions</b>	<b>Specific Conservation Actions</b>	<b>Priority</b>
Lack of Information	Referenced in literature but current populations unknown	Determine and Map Distribution	Survey to determine if extant	H

<b>Sluice Snaggletooth</b>		<b>Biology and Life History</b>	<b>Population</b>	<b>Distribution</b>
<i>Gastrocopta ashmuni</i> Tier III Mollusk		No habitat information has been reported. Likely to occur in leaf litter in mesic canyons and other riparian areas.	Only one historical occurrence. Thought to be rare, only because of lack of data of any kind on this species.	One occurrence was in Zion National Park in Washington County. More information is needed to determine distribution and current status of this species in the state.
<b>General Threats</b>	<b>Specific Threats</b>	<b>General Conservation Actions</b>	<b>Specific Conservation Actions</b>	<b>Priority</b>
Lack of Information	Reference in literature but current populations unknown	Determine and Map Distribution	Survey to determine if extant	H

Smooth Glenwood Pyrg <i>Pyrgulopsis chamberlini</i> Tier II Mollusk		Biology and Life History	Population	Distribution	
		Restricted to aquatic habitat produced by two associated springs.	Population size and trends unknown.	Sevier County.	
General Threats	Specific Threats	General Conservation Actions		Specific Conservation Actions	Priority
Limited Distribution	2 known populations today	Determine and Map Distribution		Determine extent of distribution in Utah	H
Human Disturbance	Recreation	Protect Significant Areas		Provide enclosures	H
Habitat Loss	Habitat degradation	Conserve Suitable Habitat		Provide enclosures	H
Lack of Information	Population status and trend unknown	Population Monitoring and Research		Determine population status and trend	H

Southern Bonneville Pyrg <i>Pyrgulopsis transversa</i> Tier II Mollusk		Biology and Life History	Population	Distribution	
		Found in habitat produced by springs.	Species is thought to be common in Utah.	Tooele, Utah and Sanpete counties.	
General Threats	Specific Threats	General Conservation Actions		Specific Conservation Actions	Priority
Limited Distribution	6 known populations today	Population Monitoring and Research		Determine population status and trends	H
Human Disturbance	Habitat degradation due to overgrazing and spring alteration	Restore Degraded Habitat		Remove agricultural water downstream of habitat	M
Habitat Loss	Habitat degradation	Conserve Suitable Habitat		Provide enclosures	M

Southern Tightcoil <i>Ogaridiscus subrupicola</i> Tier II Mollusk		Biology and Life History	Population	Distribution	
		Associated with small caves.	Population size and trends unknown.	Found in caves in Utah.	
General Threats	Specific Threats	General Conservation Actions		Specific Conservation Actions	Priority
Habitat Loss	Destruction or alteration of habitat due to mining activities	Conserve Suitable Habitat		Provide fencing or other protection of suitable habitat	M

<b>Sub-globose Snake Pyrg</b> <i>Pyrgulopsis saxatilis</i> Tier II Mollusk		<b>Biology and Life History</b>	<b>Population</b>	<b>Distribution</b>
		Found in habitats produced by thermal springs in a single spring complex.	Population size and trends unknown.	Millard County.
<b>General Threats</b>	<b>Specific Threats</b>	<b>General Conservation Actions</b>	<b>Specific Conservation Actions</b>	<b>Priority</b>
Limited Distribution	Known from one location only	Protect Significant Areas	Provide enclosures	H
Human Disturbance	Recreation	Protect Significant Areas	Provide enclosures	H
High Percent of Global Population	Known from one location only	Determine and Map Distribution	Expand search for additional populations	L
Habitat Loss	Habitat degradation	Conserve Suitable Habitat	Provide enclosures	H
Lack of Information	Population status and trend unknown	Population monitoring and research	Determine population status and trends	M

<b>Utah Physa</b> <i>Physella utahensis</i> Tier II Mollusk		<b>Biology and Life History</b>	<b>Population</b>	<b>Distribution</b>
		Prefers small pools associated with springs.	4 reported populations in Utah.	Utah, Colorado and Wyoming.
<b>General Threats</b>	<b>Specific Threats</b>	<b>General Conservation Actions</b>	<b>Specific Conservation Actions</b>	<b>Priority</b>
Limited Distribution	2 known populations today	Population Monitoring and Research	Determine population status and trends	H
Habitat Loss	Habitat degradation	Conserve Suitable Habitat	Provide enclosures	H

<b>Western Pearlshell</b> <i>Margaritifera falcata</i> Tier II Mollusk		<b>Biology and Life History</b>	<b>Population</b>	<b>Distribution</b>
		Occurs in fresh water streams with fast moving waters.	May be extirpated.	Native to the northern Utah.
<b>General Threats</b>	<b>Specific Threats</b>	<b>General Conservation Actions</b>	<b>Specific Conservation Actions</b>	<b>Priority</b>
Human Disturbance	Habitat dewatering	Protect Significant Areas	Provide enclosures	H
Lack of Information	Current distribution unknown; may be extirpated	Determine and Map Distribution	Determine extent of distribution in Utah	H
Habitat Loss	Habitat degradation	Conserve Suitable Habitat	Provide enclosures	H

<b>Wet-rock Physa</b> <i>Physella zionis</i> Tier II Mollusk		<b>Biology and Life History</b>	<b>Population</b>	<b>Distribution</b>
		Associated with seeps and hanging gardens of vertical sandstone walls.	Population size and trends unknown.	Zion Canyon and Orderville Canyon.
<b>General Threats</b>	<b>Specific Threats</b>	<b>General Conservation Actions</b>	<b>Specific Conservation Actions</b>	<b>Priority</b>
Limited Distribution	2 known populations today	Population Monitoring and Research	Determine population status and trends	H
High Percent of Global Population	Known from two locations only	Determine and Map Distribution	Determine extent of Utah distribution	M
Development	Dewatering of canyons	Control and Monitor Disturbance	Seek opportunities to protect flows	H

<b>Yavapai Mountainsnail</b> <i>Oreohelix yavapai</i> Tier II Mollusk	<b>Biology and Life History</b>	<b>Population</b>	<b>Distribution</b>	
	Associated with aspen and in rocky habitats.	Population size and trends unknown.	Navajo Mountain and Abajo Mountains in San Juan County.	
<b>General Threats</b>	<b>Specific Threats</b>	<b>General Conservation Actions</b>	<b>Specific Conservation Actions</b>	<b>Priority</b>
Limited Distribution	One location found in 2004	Population Monitoring and Research	Determine population status and trends	M
Development	Logging practices may have negatively affected	Conserve Suitable Habitat	Provide enclosures	H
Human Disturbance	Recreation	Control and Monitor Disturbance	Provide enclosures	H

## **Implementing Conservation Actions for Tier I Species**

As discussed in Chapter 5, Tier I includes all species listed under the Endangered Species Act, including endangered, threatened, candidate and conservation agreement Species. Section 4(f)(1) of the Endangered Species Act requires the Secretary of the Interior to develop and implement recovery plans for all species listed as federally threatened or endangered. Therefore, the implementation of conservation actions for most Tier I species listed in Table 6.1 is ultimately the responsibility of the federal government through the USFWS. In practice, most recovery programs are implemented by the cooperative efforts of many entities, and, in Utah, the UDWR is a prominent partner in recovery implementation efforts. In addition to species-specific recovery plans, habitat conservation plans (HCPs) and conservation agreements also provide detailed conservation and recovery implementation guidance. The purpose of the habitat conservation planning process is to ensure there is adequate minimizing and mitigating of the effects of authorized incidental take. Congress also intended that HCPs could include conservation measures for candidate species, proposed species, and other species not listed under the Endangered Species Act at the time an HCP is developed or a permit application is submitted.

For the species addressed in these documents, standing multi-party committees have been established that have the responsibility of carrying out the actions prescribed in the plans. These committees will establish implementation schedules for short and long-term conservation efforts by annually reviewing work plans, reevaluating priorities, and assigning tasks to be accomplished. Examples of such committees affecting Utah's species include the Upper Colorado River Endangered Fishes Recovery Implementation Programs, June Sucker Recovery Implementation Program, Black-footed Ferret Recovery Program, and Southwestern Willow Flycatcher Recovery Program. While each of the programs, committees, conservation teams, etc., vary in their specific operations, all have generally similar approaches to implementing actions to benefit species.

## **Implementing Conservation Actions for Tier II and Tier III Species**

Wildlife in Utah that is not covered by the Endangered Species Act (including Tier II and Tier III species) is managed under the authority of the UDWR. Because these species do not have federal status, implementation of conservation actions for these species, like the development of the CWCS, requires coordination and cooperation between the UDWR and other agencies that manage resources in the state. Specifically, partners must determine which agency will provide leadership on a conservation action, as well as define the roles and responsibilities of other participating organizations. Partners in implementation include federal and state agencies, local governments, Indian Tribes, private landowners, conservation organizations, and private industry. Individual partner participation may involve incorporating conservation recommendations into existing land or resource management programs, active management, or monitoring.

Implementation of conservation actions by the UDWR is facilitated through work planning. The UDWR convenes annual work planning meetings in each of the five regions of the state each winter for both aquatic and wildlife species. Program coordinators negotiate with regions to determine the amount of time devoted to specific projects. The prioritization of conservation actions for Tier II and Tier III species (High, Medium, and Low in Table 6.1) will influence

future work plans in each region and Tier II and III species conservation actions will be included in UDWR annual work plans whenever possible. Efforts will be dedicated to Tier II and III species as State Wildlife Grants, non-federal matching funds (such as the Endangered Species Mitigation Fund; Appendix K), and cooperative agreements are available.

Outside of UDWR, partnering agencies and organizations engage in their own planning efforts to manage and conserve specific resources. The resources of the CWCS, such as species and habitat threats and actions, are now available to these agencies for use in planning and implementation of conservation actions. For example, CWCS information may be included in future Nature Conservancy Ecoregional Planning and U.S. Forest Service forest plans (see Chapter 3 for partnering agencies and their planning efforts). The voluntary nature of partner involvement in implementation does not ensure that partners will implement all of the conservation actions recommended in the CWCS. However, UDWR requested and received guidance from other resource management agencies and participation from the public and other stakeholders in the development of the CWCS. UDWR hopes that partners will be equally involved in implementing the plan's recommended conservation actions. The extent to which the CWCS is used by other agencies will be determined by their statutory requirements and within the permitted degree of discretion. The UDWR intends to design more specific implementation plans for priority species and habitats in collaboration with partners within six months of NAAT ratification of the Utah CWCS.

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## CHAPTER 7 . KEY HABITATS FOR SPECIES OF GREATEST CONSERVATION NEED

(Element 2)

This chapter of the Utah Comprehensive Wildlife Conservation Strategy (CWCS) identifies key habitats of greatest conservation need, and describes the locations and relative conditions of these habitats. The identification of key habitats is the first step in a process that will ultimately identify and prioritize conservation focus areas within each key habitat type. Conservation actions will then be implemented within the identified focus areas.

### HABITAT CATEGORIES

Utah is a large, ecologically diverse state that contains habitats ranging from the low desert scrub of the Mojave Desert, to the wetlands surrounding the Great Salt Lake, to the alpine tundra and coniferous forests of the Uinta and Wasatch Mountains. In order to account for this diversity, utilize the best available GIS data, and maintain consistency with other planning efforts, UDWR used, for the purposes of the CWCS, slightly modified GAP habitat categories that are utilized by the already implemented Utah Partners in Flight Avian Conservation Strategy (UTACS). The only change to these habitat categories was the splitting of the “water” category into lentic (standing) water and lotic (flowing) water. This change was made in order to better represent the habitat preferences of certain non-avian species, such as fishes. The Utah CWCS habitat categories are listed and described in Table 7.1.

**Table 7.1. Descriptions of Utah Comprehensive Wildlife Conservation Strategy Habitat Categories**

HABITAT	% OF TOTAL AREA OF UTAH	DESCRIPTION
<b>RIPARIAN</b>		
Lowland Riparian	<b>0.2%</b>	Riparian areas generally <1,670 m (<5,500 ft) elevation; principal woody species include: Fremont cottonwood ( <i>Populus fremontii</i> ), salt cedar ( <i>Tamarix pentandra</i> ), netleaf hackberry ( <i>Celtis reticulata</i> ), velvet ash ( <i>Fraxinus velutina</i> ), desert willow ( <i>Chilopsis linearis</i> ), other willow ( <i>Salix</i> spp.), and squawbush ( <i>Rhus trilobata</i> ).
Mountain Riparian	<b>0.2%</b>	Riparian areas generally >1,670 m (>5,500 ft) elevation; principal woody species include: willow, narrowleaf cottonwood ( <i>Populus angustifolia</i> ), thinleaf alder ( <i>Alnus tenuifolia</i> ), water birch ( <i>Betula occidentalis</i> ), black hawthorn ( <i>Crataegus douglasii</i> ), rocky mountain maple ( <i>Acer glabrum</i> ), red-osier dogwood ( <i>Cornus stolonifera</i> ), and wild rose ( <i>Rosa woodsii</i> ).
Wetland	<b>0.2%</b>	Low elevation marsh and wetland areas <1,670 m (<5,500 ft) elevation; principal species include: cattail ( <i>Typha latifolia</i> ), bullrush ( <i>Scirpus</i> spp.), and sedge ( <i>Carex</i> spp.).

Wet Meadow	<b>&lt;0.1%</b>	Water saturated meadows that include mostly grasses, forbs, sedges, and rushes ( <i>Juncus</i> spp.) at 1,000-3,000 m (3,300-9,800 ft) elevation. Principal species include sedges, rushes, reedgrass ( <i>Calamagrostis</i> spp.), timothy ( <i>Phleum</i> spp.), Alpine (?) ( <i>Poa</i> spp.), hairgrass ( <i>Deschampsia cespitosa</i> ), willowherb ( <i>Epilobium</i> spp.), cinquefoil ( <i>Potentilla</i> spp.), saxifrage ( <i>Saxifraga</i> spp.), etc. Primary associated species include: willow, honeysuckle ( <i>Lonicera</i> spp.), and water birch.
Playa	<b>4.4%</b>	Sand flats and mosaics of sparsely vegetated and barren playa flats at 1,280-1,620 m (4,200-5,300 ft) elevation. Principal vegetation is pickleweed ( <i>Allenrolfea occidentalis</i> ). Primary associated species include: samphire ( <i>Salicornia</i> spp.), mound saltbush ( <i>Atriplex falcata</i> ), greasewood, saltgrass ( <i>Distichlis stricta</i> ), and seepweed.
<b>SHRUBLANDS</b>		
Shrubsteppe	<b>13.4%</b>	Shrubland principally dominated by big sagebrush ( <i>Artemisia tridentata</i> ), black sagebrush ( <i>Artemisia nova</i> ), low sagebrush ( <i>Artemisia arbuscula</i> ), or silver sagebrush ( <i>Artemisia cana</i> ); or dominate sagebrush shrub land and perennial grassland at 750-3,500 m (2,500-11,500 ft) elevation. Principal associated grass species include: bluebunch wheatgrass ( <i>Agropyron spicatum</i> ), needlegrass ( <i>Stipa comata</i> ), sand dropseed ( <i>Sporobolus cryptandrus</i> ), blue grama ( <i>Bouteloua gracilis</i> ), Thurber's needlegrass ( <i>Stipa thurberiana</i> ), western wheatgrass ( <i>Agropyron smithii</i> ), Indian ricegrass ( <i>Oryzopsis hymenoides</i> ), galleta ( <i>Hilaria jamesii</i> ), and cheatgrass ( <i>Bromus tectorum</i> ). Primary associated shrub species include: rabbitbrush ( <i>Chrysothamnus</i> spp.), snakeweed ( <i>Gutierrezia sarothrae</i> ), winterfat ( <i>Ceratoides lanata</i> ), shadscale ( <i>Atriplex confertifolia</i> ), bitter brush ( <i>Purshia tridentata</i> ), and oak ( <i>Quercus</i> spp.). Primary associated tree species include: juniper ( <i>Juniperus</i> spp.), pinyon ( <i>Pinus</i> spp.), mountain mahogany ( <i>Cercocarpus montanas</i> ), and ponderosa pine ( <i>Pinus ponderosa</i> ).
Mountain Shrub	<b>1.3%</b>	Deciduous shrubland at 1,000-3,000 m (3,300-9,800 ft) elevation principally dominated by mountain mahogany, cliff rose ( <i>Cowania mexicana</i> ), bitter brush, serviceberry ( <i>Amelanchier utahensis</i> ) and ( <i>Amelanchier alnifolia</i> ), buckbrush ( <i>Ceanothus</i> spp.), chokecherry ( <i>Prunus virginiana</i> ), snowberry ( <i>Symphoricarpos</i> spp.), pointleaf manzanita ( <i>Arctostaphylos pungens</i> ), and bearberry ( <i>Arctostaphylos uva-ursi</i> ); or deciduous shrub land principally dominated by bigtooth maple ( <i>Acer grandidentatum</i> ); or forest principally dominated by mountain mahogany; or conifer forest; or woodland with spruce-fir dominate/associate or co-dominate with mountain shrub; Primary associated shrub species include: Gambel's oak ( <i>Quercus gambelii</i> ), currant ( <i>Ribes</i> spp.), ninebark ( <i>Physocarpus</i> spp.), mountain lover ( <i>Paxistima myrsinites</i> ), blueberry ( <i>Vaccinium</i> spp.), elderberry ( <i>Sambucus</i> spp.), Oregon grape ( <i>Mahonia repens</i> ), and pointleaf manzanita. Primary associated tree species include: Rocky Mountain maple ( <i>Acer glabrum</i> ), aspen ( <i>Populus tremuloides</i> ), Douglas fir ( <i>Pseudotsuga menziesii</i> ), white fir ( <i>Abies concolor</i> ), limber pine ( <i>Pinus flexilis</i> ), alpine fir ( <i>Abies lasiocarpa</i> ), Engelmann spruce ( <i>Picea engelmannii</i> ), and ponderosa pine.

High Desert Scrub	25.2%	Shrublands at 670-3,150 m (2,200-10,300 ft) elevation principally dominated by greasewood ( <i>Sarcobatus vermiculatus</i> ), shadscale, graymolly ( <i>Kochia vestita</i> ), mat-atriplex ( <i>Atriplex corrugata</i> ), Castle Valley clover ( <i>Atriplex cuneata</i> ), winterfat, budsage ( <i>Artemisia spinescens</i> ), four-wing saltbush ( <i>Atriplex canescens</i> ), halogeton ( <i>Halogeton glomeratus</i> ), Mormon tea ( <i>Ephedra</i> spp.), horsebrush ( <i>Tetradymia canescens</i> ), snakeweed and rabbitbrush; or low elevation perennial grassland co-dominate with shrubland. Principal grassland species include: galleta, indian ricegrass, three-awn grass ( <i>Aristida glauca</i> ) and sand dropseed. Primary associated forb species include: desert trumpet ( <i>Eriogonum inflatum</i> ). Primary associated shrub species include: sagebrush, and black brush ( <i>Coleogyne ramosissima</i> ); other associated species include seepweed ( <i>Suaeda torreyana</i> ).
Low Desert Scrub	4.6%	Shrubland at 670-1,830 m (2,200-6,000 ft) elevation principally dominated by black brush or creosote ( <i>Larrea tridentata</i> ), or white bursage ( <i>Ambrosia dumosa</i> ). Primary associated shrub species include: spiny hopsage ( <i>Grayia spinosa</i> ), Mormon tea, shadscale, snakeweed, turpentine bush ( <i>Thamnosia montana</i> ), dalea ( <i>Dalea fremonti</i> ), honey mesquite ( <i>Prosopis glandulosa</i> ), and brittlebush ( <i>Encelia farinosa</i> ); other associated species include joshua tree ( <i>Yucca brevifolia</i> ), datil yucca ( <i>Yucca baccata</i> ), prickly pear ( <i>Opuntia engelmannii</i> ), and other cacti.
Northern Oak	2.8%	Deciduous shrubland principally dominated by Gambel's oak at 1,125-2,750 m (3,700-9,000 ft) elevation. Primary associated shrub species include: bigtooth maple and sagebrush ( <i>Artemisia</i> spp.). Primary associated tree species include aspen and mountain mahogany.
Desert Oak	0.8%	Deciduous shrubland principally dominated by wavyleaf oak ( <i>Quercus undulata</i> ) and shrub live oak ( <i>Quercus turbinella</i> ) at 820-2,100 m (2,700-7,000 ft) elevation. Primary associated tree species include: juniper, pinyon, and ponderosa pine.
<b>GRASSLAND</b>		
Grassland	3.5%	Perennial and annual Grasslands; or herbaceous dry meadows, including mostly forbs and grasses occurring at 640-2,740 m (2,200-9,000 ft) elevation. Principal perennial grass species include: bluebunch wheatgrass, sandburg bluegrass ( <i>Poa secunda</i> ), crested wheatgrass ( <i>Agropyron cristatum</i> ), basin wildrye ( <i>Elymus cinereus</i> ), galleta, needlegrass, sand dropseed, blue gramma, Thurbers needlegrass, western wheatgrass, squirreltail ( <i>Sitanion hystris</i> ), timothy ( <i>Phleum</i> spp.), poa ( <i>Poa</i> spp.), spike ( <i>Trisetum spicatum</i> ), Indian ricegrass, and some sedges. Principle annual grass species is cheatgrass. Principal forb species include: yarrow ( <i>Achillea millefolium</i> ), dandelion ( <i>Taraxacum officinale</i> ), Richardson's geranium ( <i>Geranium richardsonii</i> ), penstemon ( <i>Penstemon</i> spp.), mulesears ( <i>Wyethia amplexicaulis</i> ), golden aster ( <i>Chrysopsis villosa</i> ), arrowleaf balsamroot ( <i>Balsamorhiza sagittata</i> ), hawkbit ( <i>Agoseris pumila</i> ), larkspur ( <i>Delphinium</i> spp.), and scarlet gilia ( <i>Gilia pulchella</i> ). Primary associated shrub species include: sagebrush, shadscale, greasewood, creosote, rabbit brush, cinquefoil, snowberry, and elderberry. Primary associated tree species is juniper.

Alpine	0.4%	Tundra vegetation at 1,980-3,500 m (6,500-11,500 ft) elevation, including sedges and avens. Principal species include: alpine avens ( <i>Geum rossii</i> , <i>G. trifolium</i> ), sedges, tufted hair grass, <i>Festuca ovina</i> , <i>Koeleria cristata</i> , spike trisetum ( <i>Trisetum spicatum</i> ), moss campion ( <i>Silene acaulis</i> ), cushion paronychia ( <i>Paronychia pulvinata</i> ), Ryberg's sandwort ( <i>Arenaria obtusiloba</i> ), dwarf clover ( <i>Trifolium nanum</i> ), Bellard's sedge ( <i>Kobresia myosuroides</i> ), American bistort ( <i>Polygonum bistortoides</i> ), <i>Eriophorum chamissonis</i> , and willow ( <i>Salix spp.</i> ). Primary associated tree species include Engelmann spruce and sub-alpine fir ( <i>Abies lasiocarpa</i> ).
<b>FOREST</b>		
Sub-Alpine Conifer	2.3%	Conifer forest principally dominated by combinations of Engelmann spruce, blue spruce ( <i>Picea pungens</i> ) and sub-alpine fir at 1,830-3,400 m (6,000-11,200 ft) elevation. Primary associated tree species include: lodgepole pine ( <i>Pinus contorta</i> ), white fir, Douglas fir, limber pine, and bristlecone pine ( <i>Pinus aristata</i> ).
Mixed Conifer	1.2%	Conifer forest principally dominated by combinations of white fir and Douglas fir at 1,500-3,050 m (5,000-10,000 ft) elevation. Primary associated tree species include: Engelmann spruce, blue spruce, and sub-alpine fir.
Ponderosa Pine	1.2%	Conifer forest or woodland at 1,600-2,700 m (5,200-8,700 ft) elevation with principally Ponderosa pine dominate/associate or co-dominate with mountain shrubs. Principal mountain shrub associated species include: manzanita ( <i>Arctostaphylos</i> ), bitter brush, Gambel's oak, snowberry, and curleaf mountain mahogany ( <i>Cercocarpus ledifolius</i> ). Primary associated tree species include: juniper, pinyon, white fir and Douglas fir. Primary associated shrub species include: sagebrush, and rabbitbrush.
Lodgepole Pine	1.0%	Conifer forest principally dominated by lodgepole pine at 1,830-3,450 m (8,000-11,000 ft) elevation. Primary associated tree species include Engelmann spruce and sub-alpine fir.
Pinyon-Juniper	19.4%	Conifer forest at 820-3,400 m (2,700-11,000 ft) elevation principally dominated by Rocky Mountain juniper ( <i>Juniperus scopulorum</i> ), One-seed juniper ( <i>Juniperus monosperma</i> ), and Utah juniper ( <i>Juniperus osteosperma</i> ); or conifer forest principally dominated by two-needle pinyon ( <i>Pinus edulis</i> ) or singleleaf pinyon ( <i>Pinus monophylla</i> ); or conifer forest co-dominated by Pinyon and Juniper. Primary associated tree species include: mountain mahogany, ponderosa pine, white fir, and Douglas fir. Primary associated shrub species include: sagebrush, black brush, and Gambel's oak.
Aspen	3.4%	Deciduous forest principally dominated by aspen at 1,400-3,200 m (5,600-10,500 ft) elevation. Primary associated conifer species include: Engelmann spruce, blue spruce, sub-alpine fir, white fir, Douglas fir, lodgepole pine, and ponderosa pine. Primary associated shrub species include snowberry and serviceberry.

ADDITIONAL HABITAT CATEGORIES		
Water - Lentic	3.4%	Open water: lakes and reservoirs.
Water - Lotic	<0.1%	Open water: streams and rivers.
Rock	<3.1%	Rock and southern Utah high elevation lava flows.
Agriculture	4.2%	Row crops, irrigated pasture and hay fields, orchards, and dry farm croplands <1,830 m (<6,000 ft) elevation.
Urban	0.7%	Commercial land and high-density residential areas <1,830 m (<6,000 ft) elevation.
Cliff	<3.1%	Vertical or near-vertical cliff facings.

\*This table was taken (and slightly modified) from Parrish et al. 2002.

Although we desire to remain consistent with other planning efforts, we are also committed to utilizing the best data available. As the resolution and accuracy of GIS data improve through efforts such as the Southwestern Regional GAP project, which should be completed during 2005, habitat categories may be revised for future versions of the Utah CWCS. If habitat categories are revised, cross-walk tables and other methods will be developed and employed to maintain consistency between the Utah CWCS and other management and conservation plans.

## HABITAT PRIORITIZATION PROCESS

A team approach was used to prioritize habitats for the Utah CWCS. The team, which consisted of Utah Division of Wildlife Resources (UDWR) employees, representatives from other government agencies, conservation organizations, an agricultural group, and a sportsmen group, eventually agreed upon five<sup>1</sup> criteria important for prioritizing habitats. The five criteria used were:

1. Abundance of the habitat in Utah, measured as the percentage of land cover according to Utah GAP Analysis;
2. Threats to the habitat in Utah, measured as both the magnitude of current threats and the amount of remaining habitat currently impacted;
3. Trends of the habitat in Utah, measured as abundance and condition of the habitat by observing current trends;

<sup>1</sup> A sixth criterion, Utah's contribution to the overall amount of the habitat type available nation-wide, was considered important by the Utah CWCS team, but was abandoned due to the paucity of high-quality nation-wide GIS data with habitat categories similar to those in the Utah CWCS. As better-quality nation-wide habitat data become available (such as through the USDA Forest Service's Forest Inventory Analysis effort, for example) this criterion may be revisited, although we do not believe that the inclusion of this factor in our analysis will significantly change our list of key Utah habitats.



4. Importance of the habitat to Tier I, II, and III species in Utah, measured as the number of Tier I, II, and III CWCS species for which the habitat was identified as the first or second most important habitat; and
5. Importance of the habitat to Utah's overall vertebrate biodiversity. This criterion measures the number of vertebrate species that use the habitat, according to Utah GAP Analysis. However, Utah GAP Analysis did not create habitat models for fishes, so UDWR personnel assigned habitats used by fish species.

Each habitat type was given a score of one (least important) to five (most important) for each criterion.

- I. Abundance in Utah
  - 1 – Abundant, more than 15% of total land cover
  - 2 – Common, between 10% and 14.9% of total land cover
  - 3 – Uncommon, between 4% and 9.9% of total land cover
  - 4 – Rare, between 1% and 3.9% of total land cover
  - 5 – Very rare, less than 1% of total land cover
- II. Threats in Utah
  - 1 – Less than 20% of remaining habitat currently impacted
  - 2 – Between 20% and 39% of remaining habitat currently impacted
  - 3 – Between 40% and 59% of remaining habitat currently impacted
  - 4 – Between 60% and 79% of remaining habitat currently impacted
  - 5 – Between 80% and 100% of remaining habitat currently impacted
- III. Trends (Abundance and Condition) in Utah
  - 1 – Definite increasing trend
  - 2 – Possible increasing trend
  - 3 – Apparently stable or trend unknown
  - 4 – Possible decreasing trend
  - 5 – Definite decreasing trend
- IV. Number of Tier I, II, and III Species for which the Habitat Type is Important (see Appendix 6.1, Utah CWCS Tier I, II, and III Species List)
  - 1 –Habitat type is important to 3 species or less
  - 2 –Habitat type is important to between 4 and 9 species
  - 3 –Habitat type is important to between 10 and 19 species
  - 4 –Habitat type is important to between 20 and 29 species
  - 5 –Habitat type is important to 30 species or more
- V. Vertebrate Biodiversity
  - 1 –Habitat type is utilized by 70 species or less
  - 2 – Habitat type is utilized by between 71 and 140 species
  - 3 – Habitat type is utilized by between 141 and 210 species
  - 4 – Habitat type is utilized by between 211 and 280 species
  - 5 – Habitat type is utilized by 281 species or more

## **HABITAT PRIORITIZATION RESULTS**

After scores were assigned for each criterion in each habitat type, the criteria scores for each habitat were summed to produce a composite score ranging from five to 25. Habitats with the highest total scores are considered to be high priority habitats and in need of conservation. The criteria scores and total scores for each habitat are listed in Table 7.2 in descending order according to total score.

Although all habitat types are valuable for wildlife, only those with total scores of 16 or greater are considered “key” habitats. These key habitats include lowland riparian, wetland, mountain riparian, shrubsteppe, mountain shrub, lotic (flowing) water, wet meadow, grassland, lentic (standing) water, and aspen. Figures 7.1 to 7.10 depict the distribution of the 10 key habitats statewide. Key habitat summaries are provided in Appendix K.

**Table 7.2. Utah CWCS Habitat Prioritization Criteria Scores and Total Scores**

<b>Habitat</b>	<b>Abundance (% Utah Land Cover)</b>	<b>Abundance Score</b>	<b>Threats Score</b>	<b>Trends Score</b>	<b>Number of Tier 1,2,3 Species</b>	<b>Tier 1,2,3 Species Score</b>	<b>Biodiversity (Number of Vertebrate Species)</b>	<b>Biodiversity Score</b>	<b>Total Score</b>
Lowland Riparian*	0.2	5	4.3	4.6	35	5	295	5	23.8
Wetland*	0.2	5	3.4	4.3	36	5	176	3	20.7
Mountain Riparian*	0.2	5	3.2	3.3	21	4	350	5	20.5
Shrubsteppe*	13.4	2	3.7	5.0	20	4	263	4	18.7
Mountain Shrub*	1.3	4	2.9	3.7	14	3	285	5	18.5
Water - Lotic (flowing)*	0.1	5	3.7	3.8	28	4	98	2	18.5
Wet Meadow*	0.1	5	3.8	4.3	4	2	201	3	18.0
Grassland*	3.5	4	2.7	3.0	22	4	226	4	17.7
Water - Lentic (standing)*	3.4	4	3.4	3.8	16	3	165	3	17.1
Aspen*	3.4	4	3.3	4.6	4	2	174	3	16.9
Ponderosa Pine	1.2	4	2.1	3.5	5	2	223	4	15.6
Low Desert Scrub	4.6	3	2.5	3.9	29	4	90	2	15.4
Agriculture	4.2	3	3.8	4.3	6	2	88	2	15.0
High Desert Scrub	25.2	1	3.3	3.5	22	4	195	3	14.8
Desert Oak	0.8	5	2.5	3.2	1	1	145	3	14.7
Mixed Conifer	1.2	4	2.0	3.4	5	2	162	3	14.4
Lodgepole Pine	1	4	2.3	3.4	4	2	127	2	13.7
Playa	4.4	3	2.7	3.9	4	2	112	2	13.6
Northern Oak	2.8	4	2.4	3.0	3	1	145	3	13.4
Sub-Alpine Conifer	2.3	4	1.8	2.6	8	2	157	3	13.3
Pinyon-Juniper	19.4	1	1.8	1.8	22	4	228	4	12.6
Rock	3.1	4	1.7	3.0	9	2	1	1	11.7
Cliff	3.1	4	1.5	3.0	7	2	0	1	11.5
Alpine	0.4	5	1.1	3.0	3	1	55	1	11.1
Urban	0.7	5	1.0	1.0	0	1	54	1	9.0

\* Denotes a Utah CWCS key habitat.

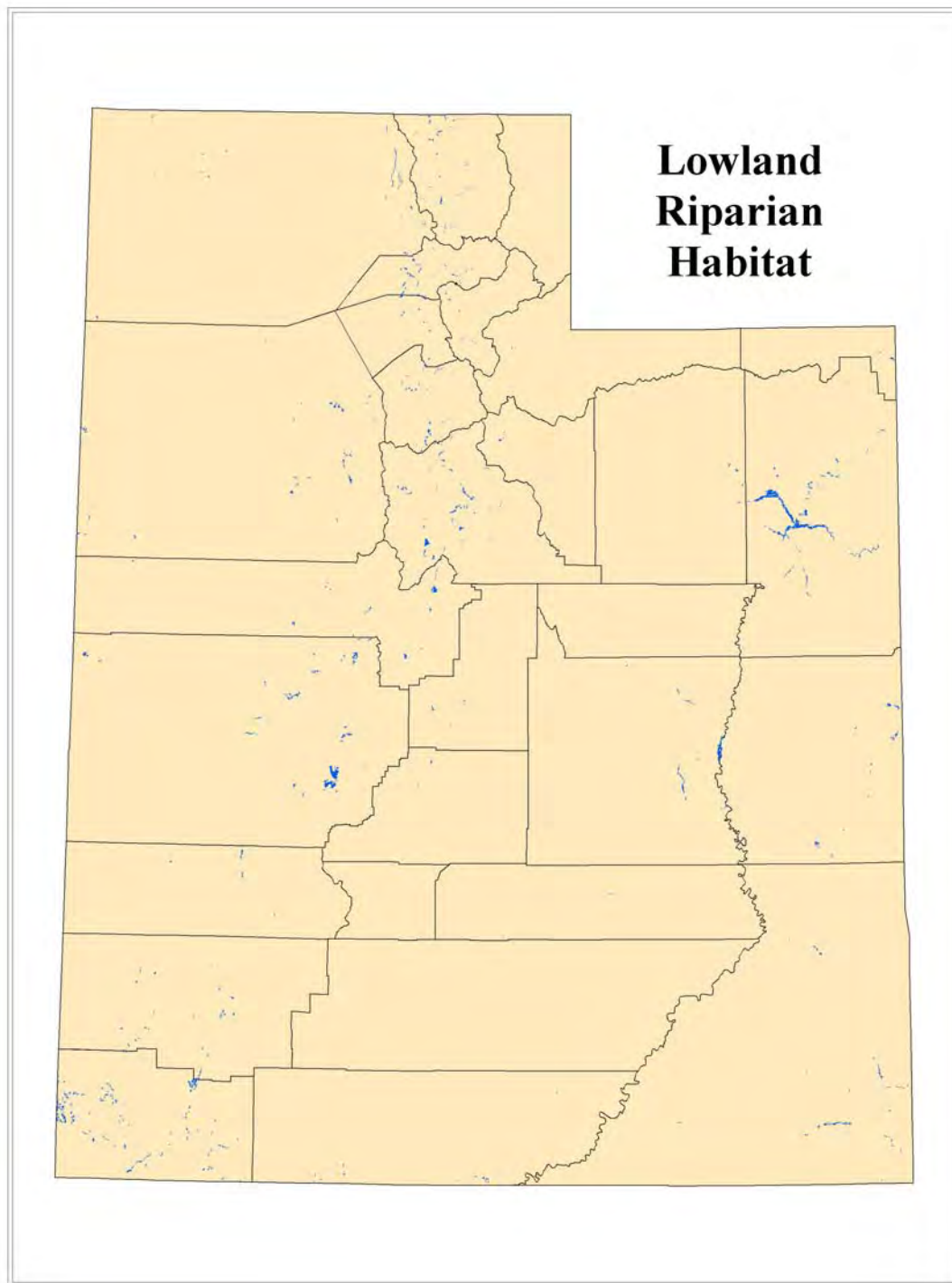


Figure 7-1. Map of Lowland Riparian Habitat in Utah

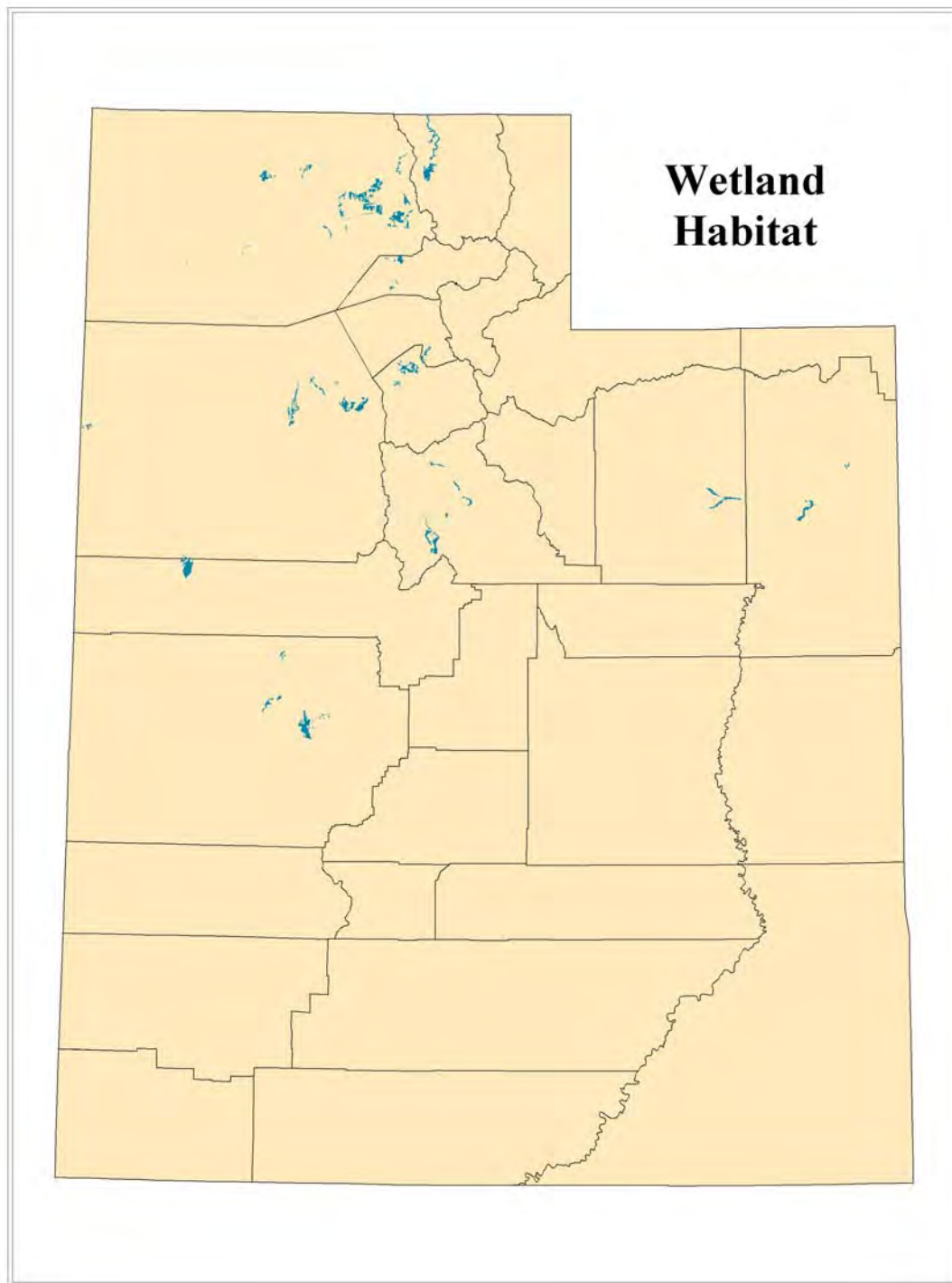


Figure 7-2. Map of Wetland Habitat in Utah

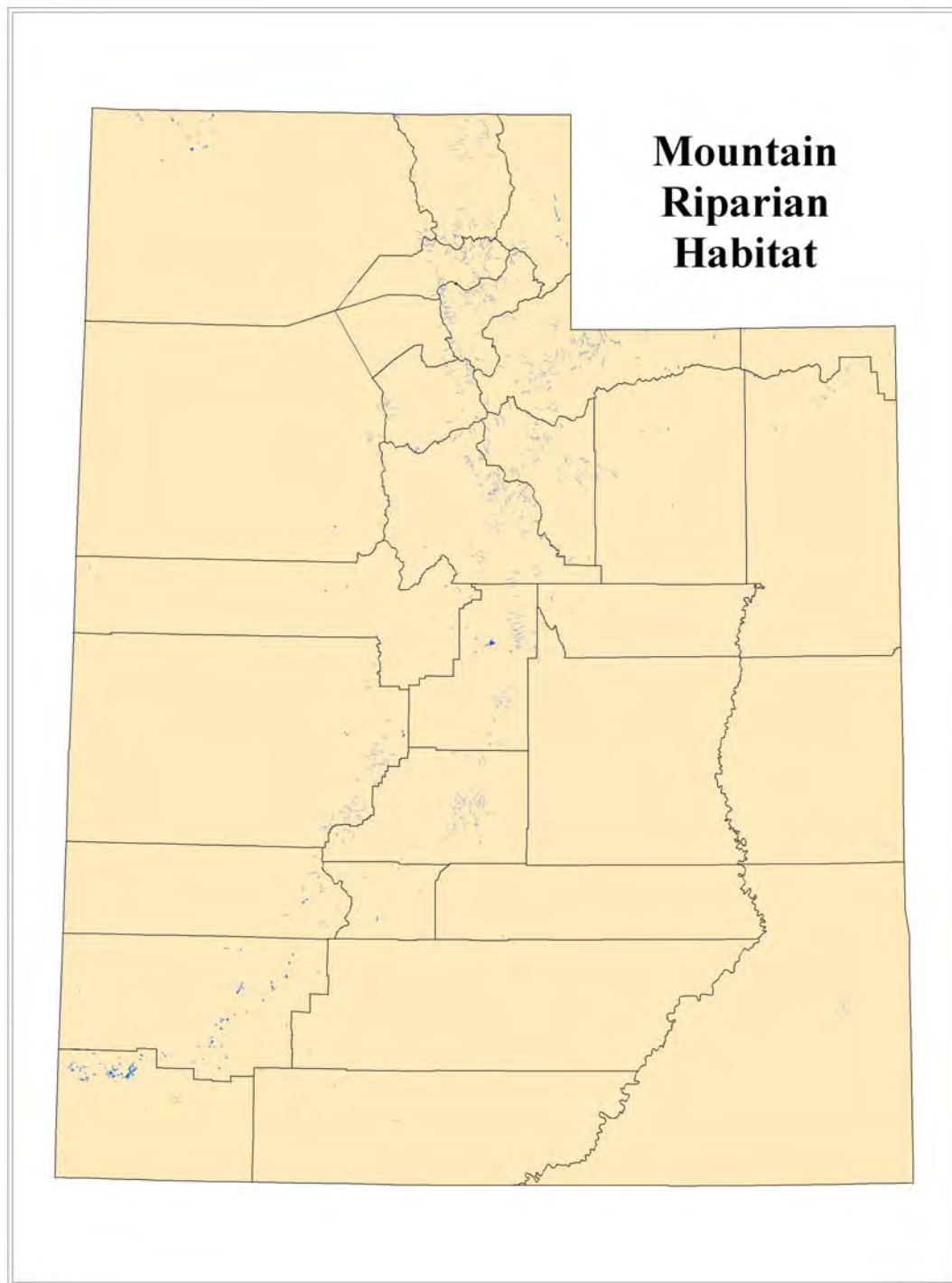


Figure 7-3. Map of Mountain Riparian Habitat in Utah

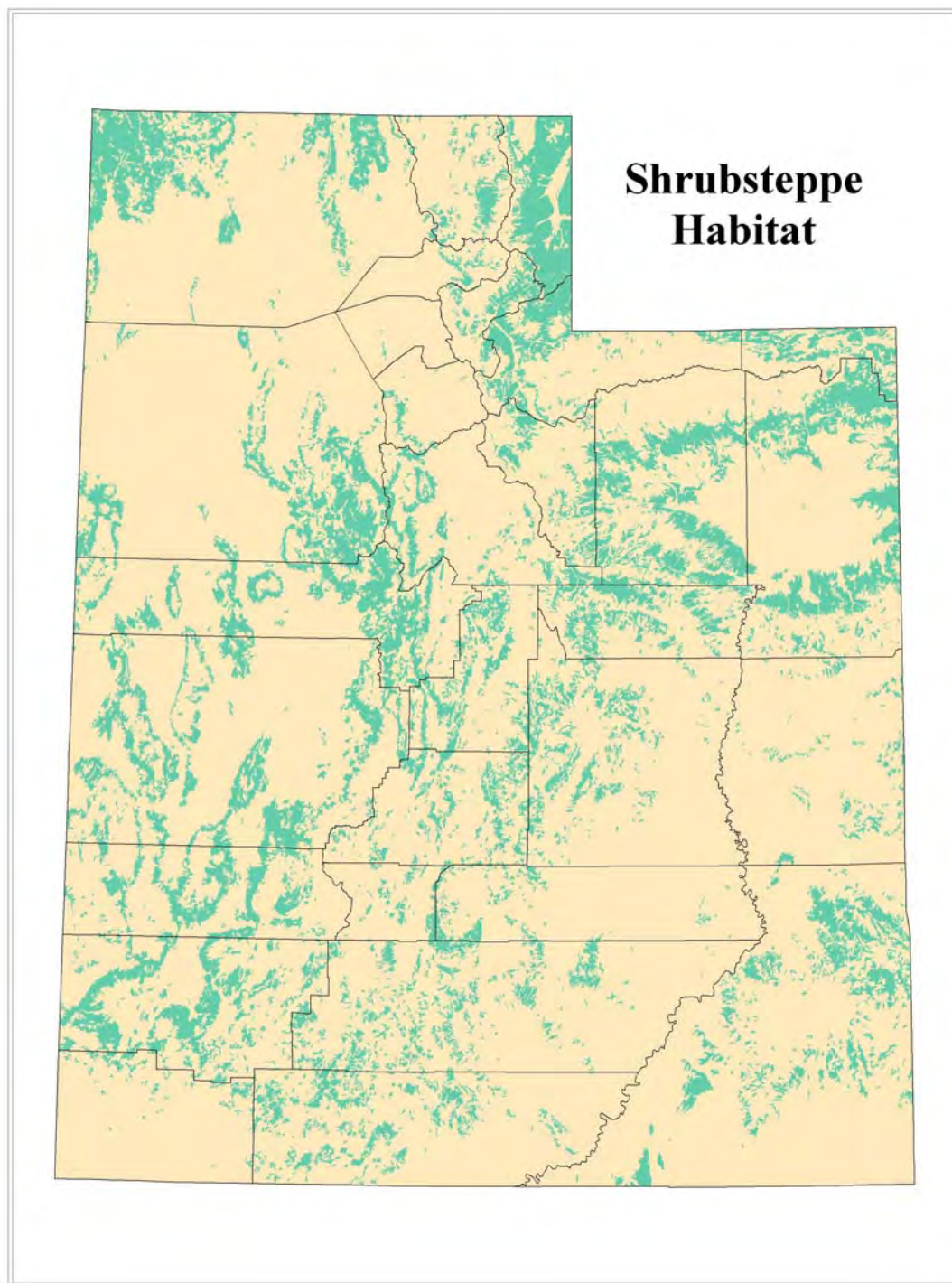


Figure 7-4. Map of Shrubsteppe Habitat in Utah



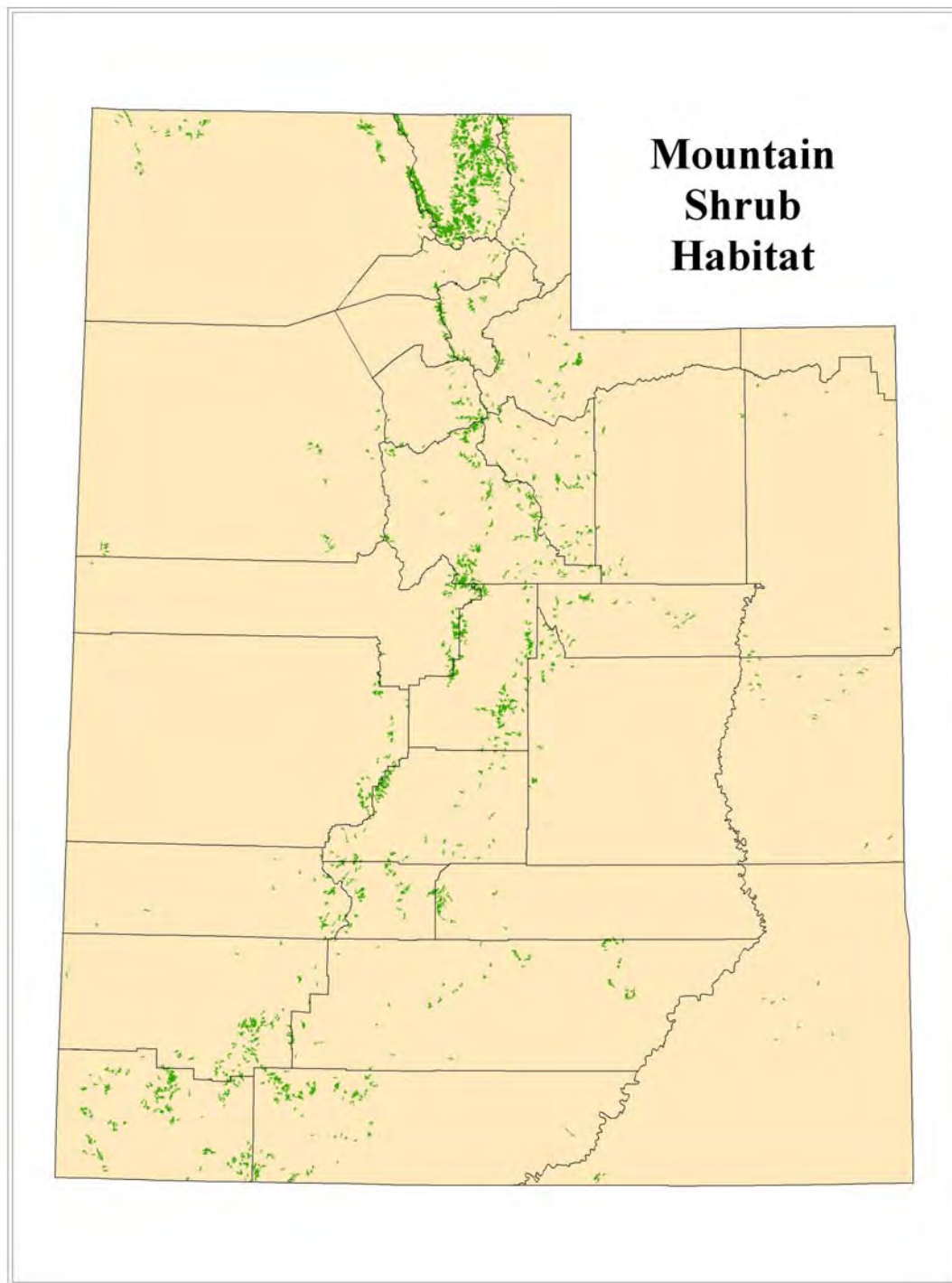


Figure 7-5. Map of Mountain Shrub Habitat in Utah



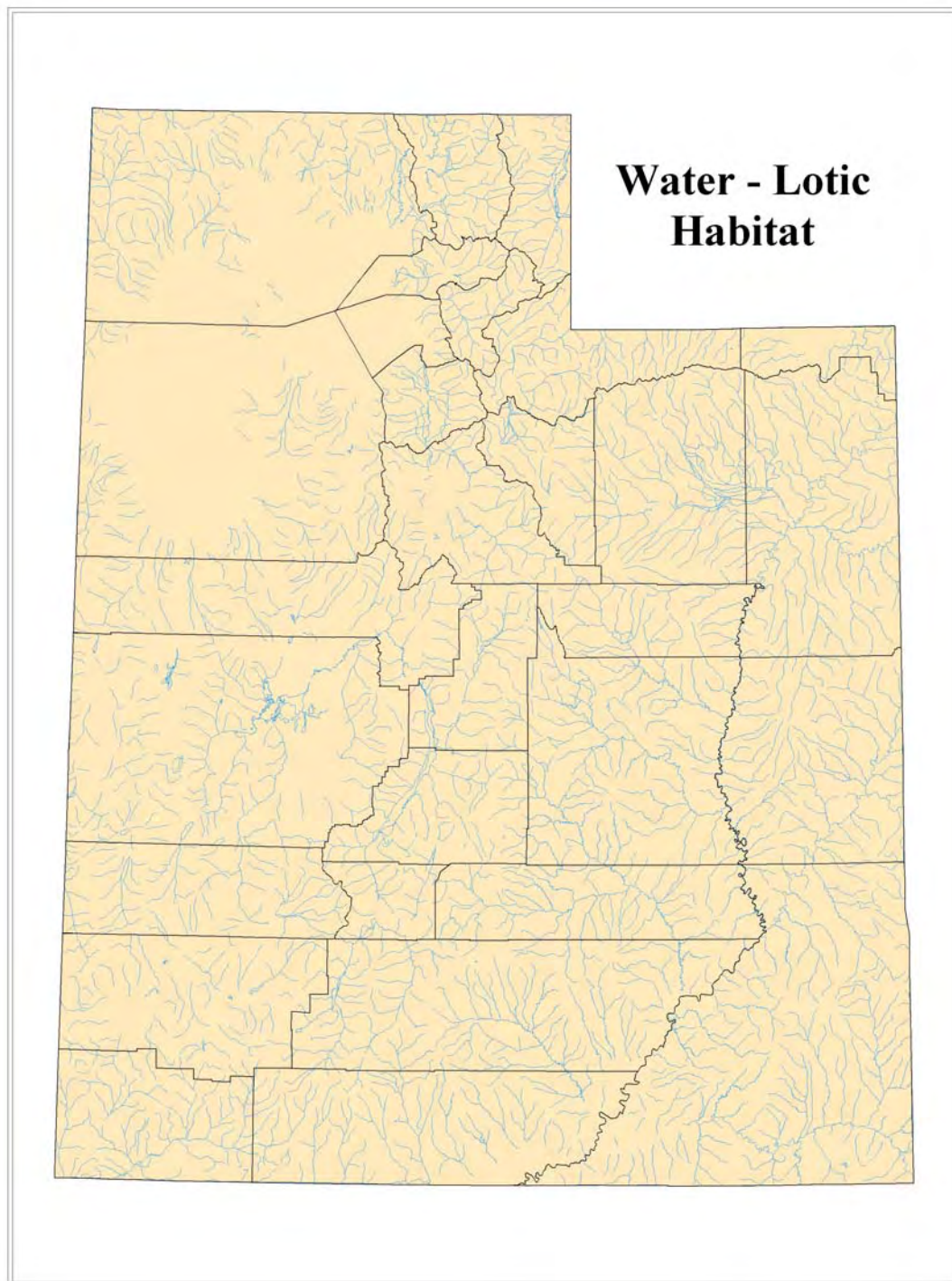


Figure 7-6. Map of Flowing Water (Lotic) Habitat in Utah



Figure 7-7. Map of Wet Meadow Habitat in Utah

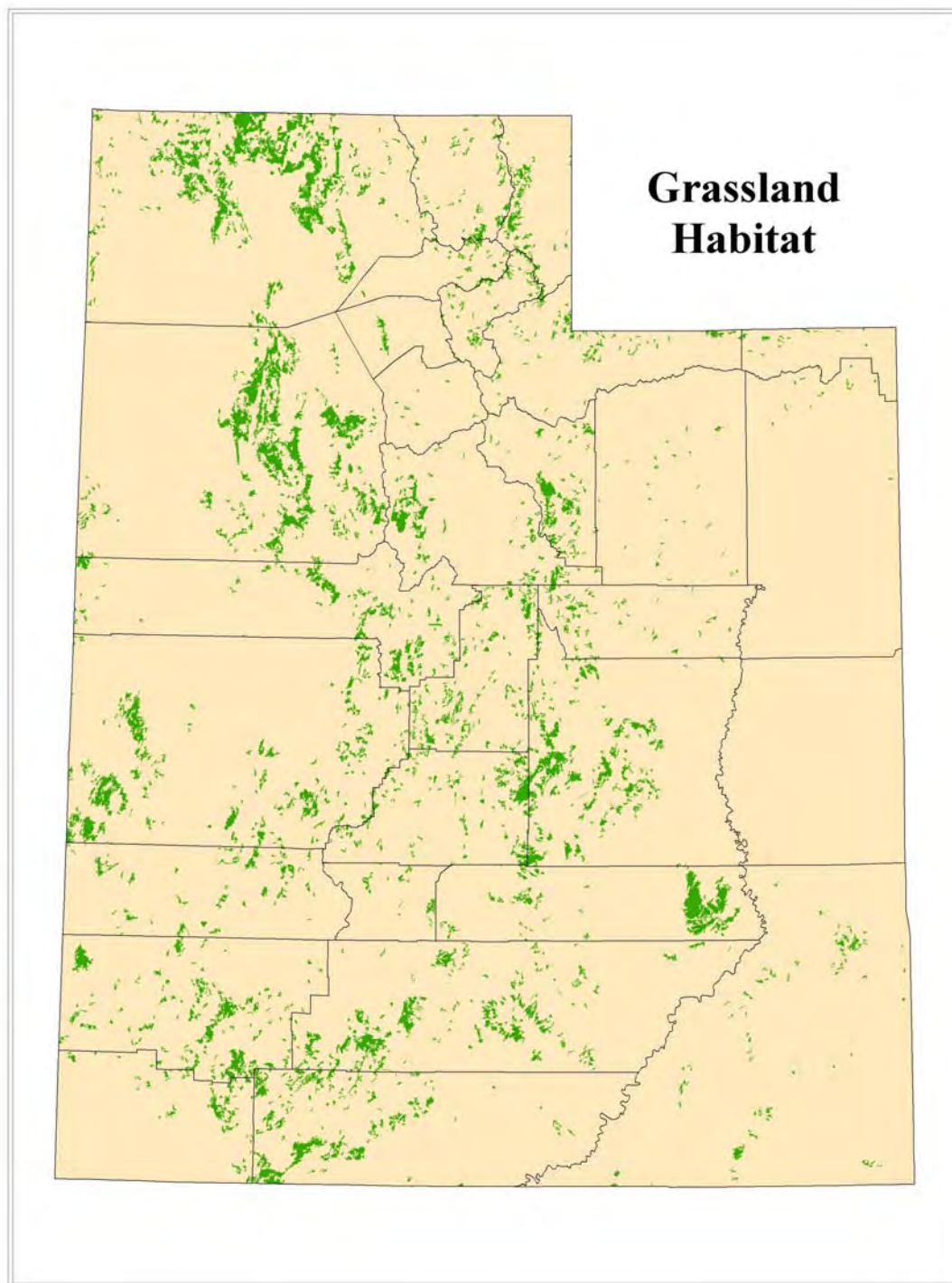


Figure 7-8. Map of Grassland Habitat in Utah



Figure 7-9. Map of Standing Water (Lentic) Habitat in Utah



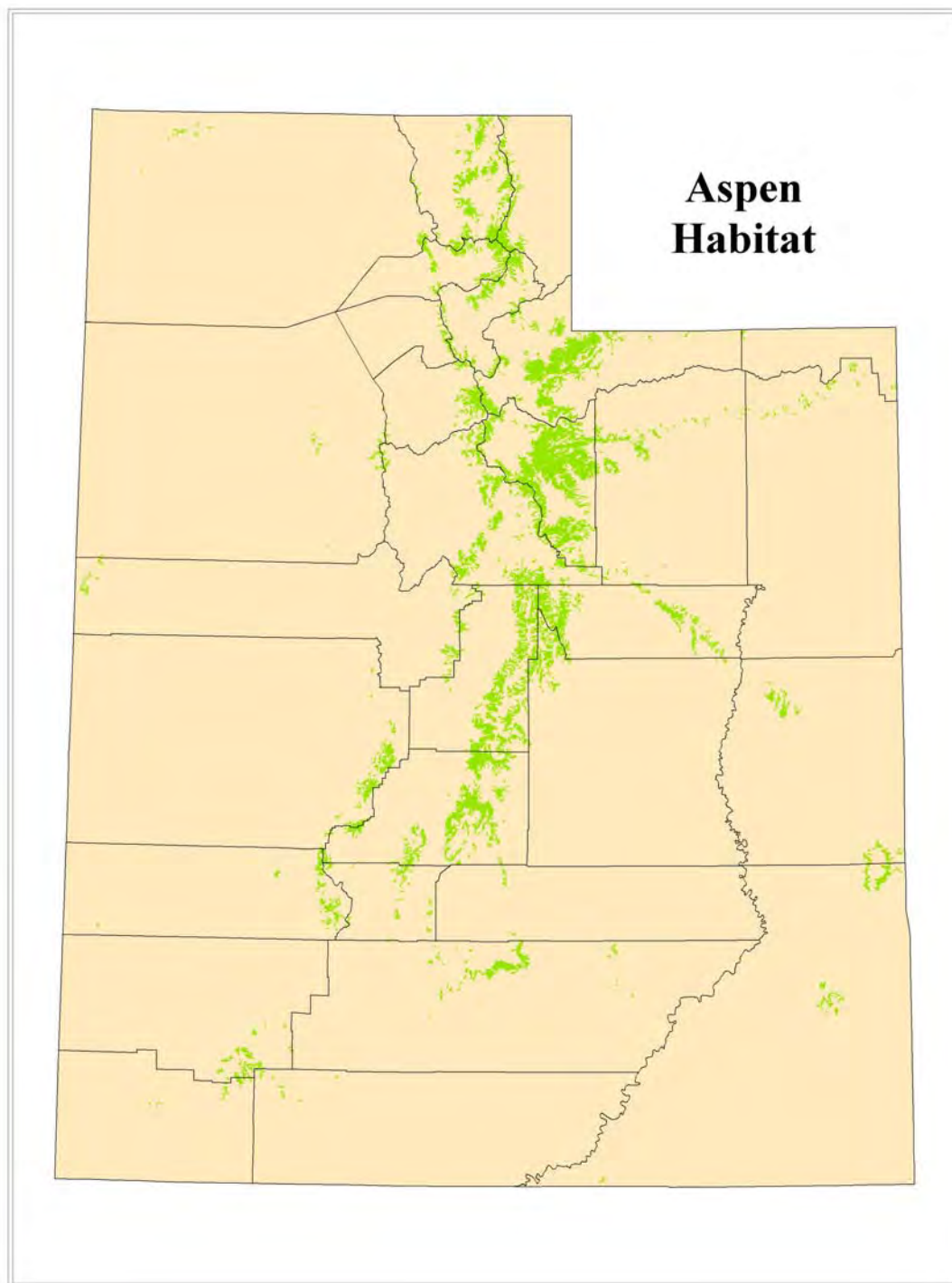


Figure 7-10. Map of Aspen Habitat in Utah

## **CONSERVATION FOCUS AREAS WITHIN KEY HABITATS**

Approximately 25.8% of Utah has been identified as a key habitat. However, because habitat conditions within key habitats are not uniform (i.e., the level of habitat degradation, the importance to species of conservation need, and the type and magnitude of threats vary from location to location), it is necessary to further refine key habitat areas so that habitat conservation and restoration activities can be as effective as possible. To this end, we have begun a process to identify “conservation focus areas” within each of the ten key habitats. A draft set of shrubsteppe habitat conservation focus areas has already been developed (Figure 7-11) and significant conservation actions in shrubsteppe habitats have already begun. Conservation focus areas for the remainder of the key habitats will be identified during the first two years of CWCS implementation. Bird Habitat Conservation Areas have also been delineated in Utah (Martinsen et. al 2005); the delineation process considered both key habitats and areas of importance to birds (Figure 7-12). Although our methodology is still being refined, the identification of conservation focus areas will likely be based on factors such as current habitat condition, species currently present, species potentially present, current threats, existing land use plans, and land ownership. In addition, areas that are already protected or that are identified in existing conservation plans will figure prominently in the identification of conservation focus areas.

## **SUMMARY**

Focusing habitat conservation and restoration activities within the conservation focus areas of the 10 key habitats is the most efficient way to benefit Utah’s species of greatest conservation need. Because of the poor conditions and current threats in these areas, there are ample opportunities for improvement. Moreover, because the key habitats and their conservation focus areas are important for multiple species of conservation need (Appendix L), well-conceived efforts to conserve and restore these habitats can benefit many imperiled species at once. As an added benefit, efforts to maintain key habitats will likely benefit other habitats (and their associated species) as well. For example, work to improve a mountain riparian corridor might reduce erosion in the surrounding mixed conifer forest. For these reasons, habitat conservation and restoration activities will be directed towards key habitat conservation focus areas and their associated species of conservation need.

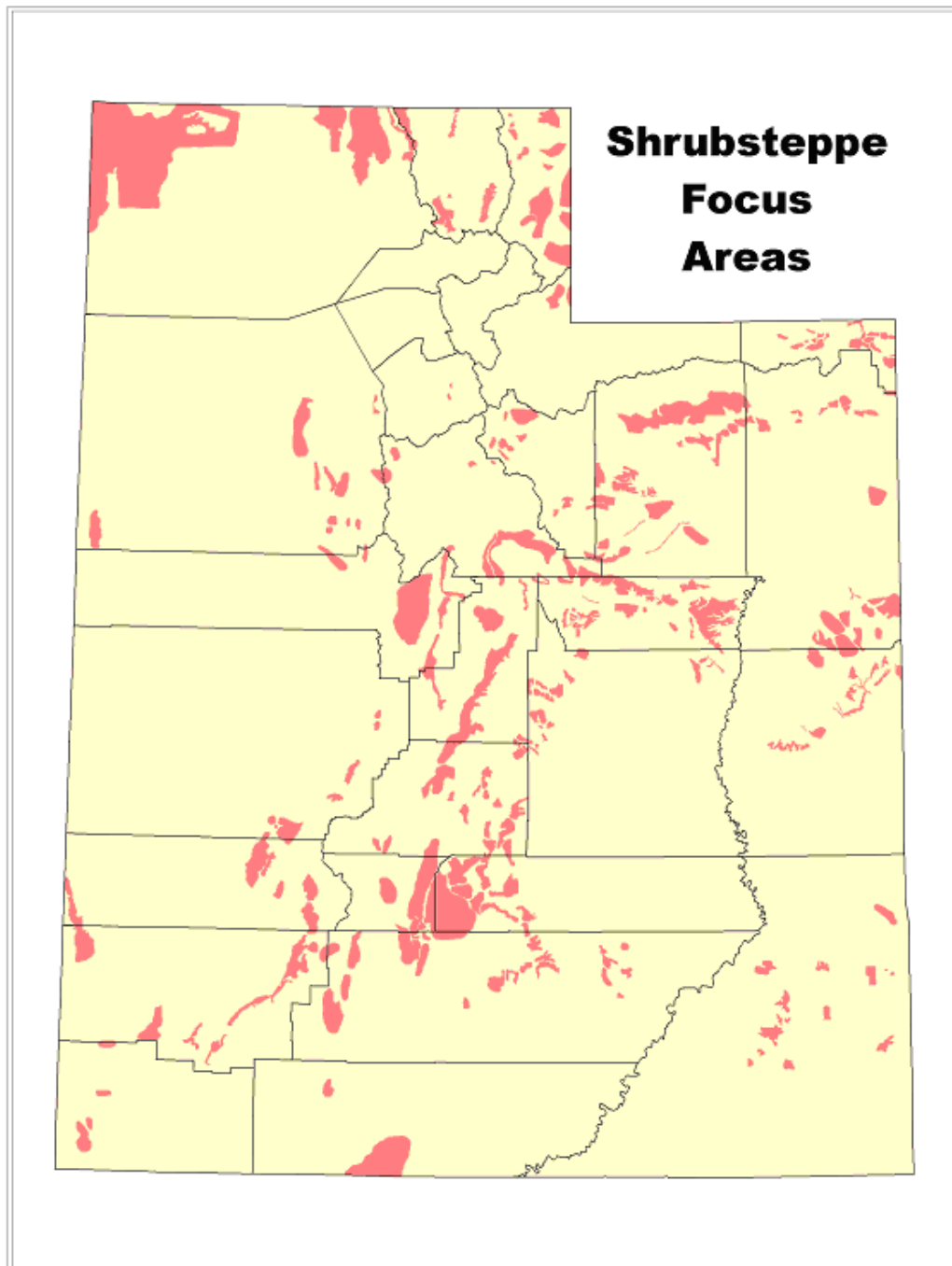


Figure 7-11. Shrubsteppe Habitat Conservation Focus Areas in Utah

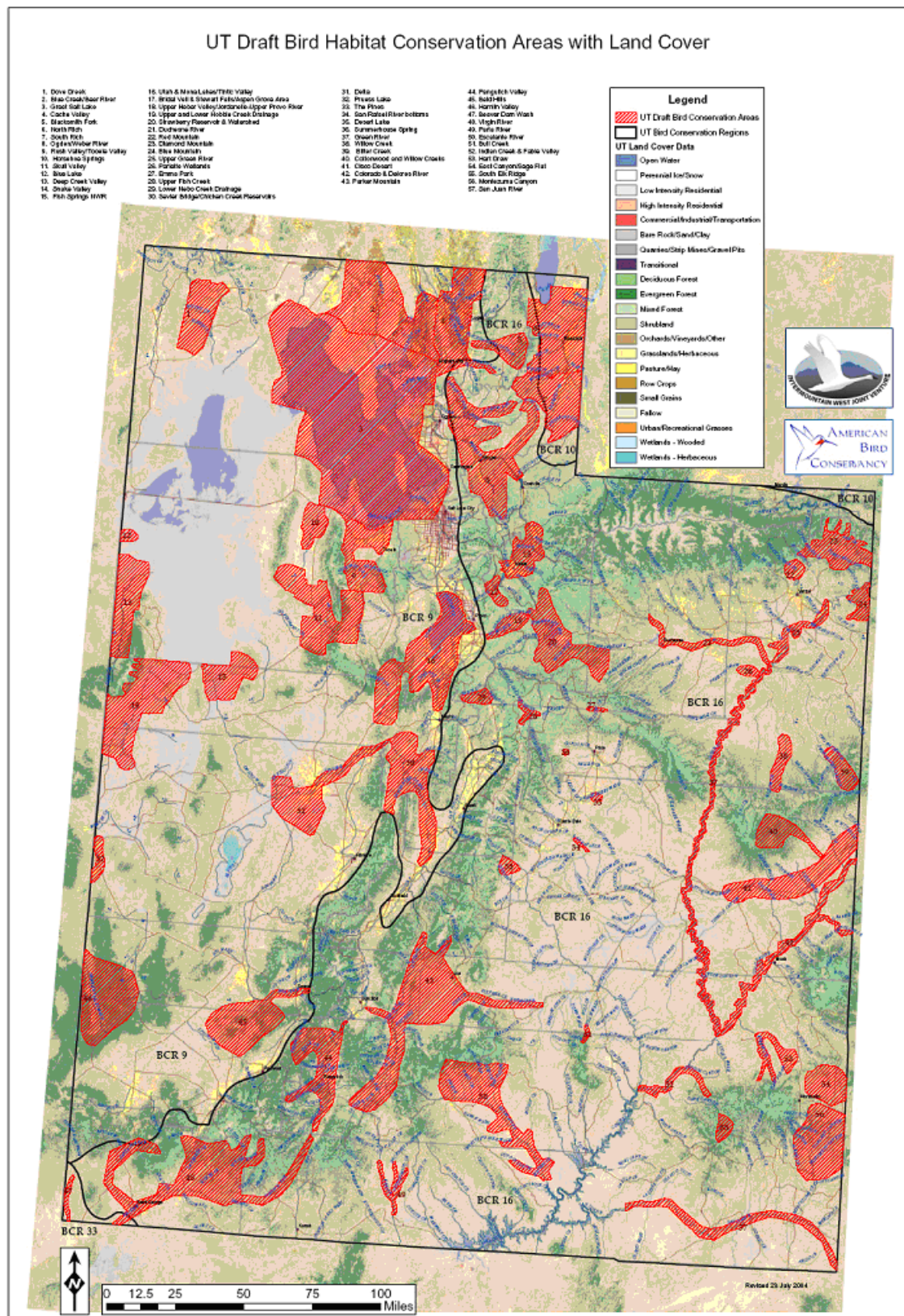


Figure 7-12. Map of Bird Habitat Conservation Areas in Utah



## **LITERATURE CITED**

- Martinsen, W., D. Paul, J. McCreary, F. P. Howe, T. Aldrich, J. R. Parrish, R. Berger, R. Player, S. Hedges, T. Wallace, J. Tuey, and D. Fagan. 2005. Coordinated Implementation Plan for Bird Conservation in Utah. Utah Steering Committee, Intermountain West Joint Venture.
- Parrish, J. R., F. P. Howe, and R. E. Norvell. 2002. Utah Partners in Flight Avian Conservation Strategy Version 2.0. Utah Division of Wildlife Resources Publication Number 02-27.

## **CHAPTER 8 . HABITAT PROBLEMS AND CONSERVATION ACTIONS**

(Elements 3 and 4)

### **IDENTIFYING HABITAT THREATS AND CONSERVATION ACTIONS**

Conservation focus areas within Utah’s ten key habitats will be targeted for habitat restoration and conservation activities. Before conservation actions can be determined, it is necessary to identify the threats and other problems (such as lack of information) facing each of the key habitats. The Utah Division of Wildlife Resources (UDWR) habitat managers throughout the state developed a preliminary list of the threats and problems associated with the key habitats. The list of threats was then reviewed and revised by representatives from UDWR, U.S. Fish and Wildlife Service, U.S.D.A. Forest Service, the Bureau of Land Management, several conservation organizations, agricultural groups, and sportsmen groups. This team also proposed conservation actions to manage each threat.

Table 8.1 lists the general threats present in each of the key habitats, as well as the general conservation actions necessary to alleviate those threats. Table 8.1 also lists specific threats and prioritized conservation actions for each key habitat, so that the Comprehensive Wildlife Conservation Strategy (CWCS) will be more useful for directing on-the-ground activities. For habitats where additional information is needed, habitat mapping, monitoring, and research are listed as appropriate conservation actions. This list of standard conservation actions linked to key habitats will guide the planning and implementation of habitat conservation and restoration programs and projects and provide links to species conservation efforts (Chapter 6).

**Table 8.1. Threats and Conservation Actions for Each Key Habitat****General Threats****(including but not limited to):**

Brush Eradication: removal of woody vegetation without retaining sufficient plant diversity or adequate seral stage representation

Channelization: straightening a stream channel, which leads to increased water velocities, increased erosion, a reduction in stream-side vegetation, & overall reduction of in-stream (aquatic) habitat quality

Dam Safety: potential loss of standing water because of problems with existing impoundments

Development: the construction of buildings, subdivisions, towers, roads, and other structures associated with human habitation/use; includes agricultural, industrial, recreational, and residential impacts

Drought: a prolonged period of significantly below-average precipitation

Energy Development: the construction of well pads, powerlines, roads, and other structures associated with oil/natural gas extraction or coal mining

Environmental Contamination: the presence of harmful substances resulting from pollution or poisoning

Fire Cycle Alteration: fire suppression and the resulting lack of disturbance; conversely, fire frequency and intensity can increase if certain invasive non-native species, such as cheatgrass, dominate an area

Improper Grazing Practices: includes overgrazing by livestock, wildlife, or wild horses, grazing at the wrong time of year, grazing without periods of rest ("deferment"), etc.

Improper OHV Use: negative impacts from off-highway vehicles used off of designated roads and trails; includes illegal trail pioneering and proliferation

Invasive Animal Species: invasion by carp or certain aquatic mollusks, resulting in altered aquatic habitats

Invasive Plant Species: invasion by cheatgrass, tamarisk, noxious weeds, or other undesirable non-native plant species

Loss of Adjacent Uplands: the loss or degradation of upland habitats, which negatively impacts nearby wetland habitats by removing buffers, altering hydrologic patterns, and increasing disturbance to wildlife

Nutrient Enrichment: eutrophication of water habitats due to excess nitrogen, phosphorus, and/or other nutrients; includes sediment loading - increased inorganic soil materials suspended in the water

Water Development: altering natural water flows through diversion, storage, pumping, and/or conveyance activities

**General Conservation Actions****(including but not limited to):**

Control and Monitor Contaminants: determine response of species to environmental contaminants, implement clean-up and remedial actions, monitor and regulate contaminant levels in cooperation with state and federal agencies

Determine & Map Distribution: use surveys, remote sensing, and other methods to determine habitat locations; record results in GIS compatible format

Education and Outreach: develop public awareness and solicit public support; increase communication and cooperation of partnering agencies and NGOs

Enforce Existing OHV Regulations: improve enforcement of OHV regulations in key habitats

Habitat Monitoring & Research: determine response of habitats and species to habitat alterations through well designed monitoring and research programs (e.g., before-after-control-impact monitoring of shrubsteppe restoration treatments)

Improve Grazing Practices: change season of use as appropriate, implement rest-rotation, fence important habitats, etc.

Increase Coordination with Federal/State Agencies, Local Governments, and Private Landowners

Increase/Secure In-stream Flow & Conservation Pools: maintain adequate water in streams (in-stream flow) and lakes/reservoirs (conservation pools) to support healthy riparian habitat and viable wildlife populations

Modify Agricultural Practices: reduce fertilizer use near select habitats

Permanent Conservation of Habitat: fee-title acquisitions or conservation easements

Properly Maintain Existing Dams: maintain dams that provide important lentic habitats so that they are not breached

Restore and Conserve Habitat: restore or conserve habitat to replace habitat lost to development

Restore Degraded Habitats: restore stream sinuosity and channel profiles, control invasive non-native vegetation, plant desirable vegetation, reintroduce natural disturbance regimes to plant communities, etc.

Restore Natural Fire Cycle Where Appropriate: maintain or restore historic fire regimes

Support Efficient Energy Development Methods: examples include directional drilling and well clustering

<b>Aspen</b>				
<b>General Threats</b>	<b>Specific Threats</b>	<b>General Conservation Action</b>	<b>Specific Conservation Action</b>	<b>Priority</b>
Development	Direct loss of habitat/habitat fragmentation	Education and Outreach	Educate the public and conservation partners about the consequences of losing aspen habitat	M
		Restore Degraded Habitats	Disturb conifers to favor aspen regeneration and replace the aspen habitat lost to development	H
		Increase Coordination with Federal/State Agencies, Local Governments, and Private Landowners	Coordinate with agency planners so that management activities enhance, not degrade, important aspen habitats; coordinate habitat management activities with private landowners who own key wildlife habitats	H
Fire Cycle Alteration	Conifers replace aspen due to lack of disturbance	Restore Natural Fire Cycle Where Appropriate	Where appropriate, support prescribed burns or other methods to disturb conifers and favor aspen regeneration	H
Improper Grazing Practices	Over-grazing by livestock or elk, or grazing at the wrong time of year can greatly degrade the value of habitat for wildlife	Improve Grazing Practices	Change season of use as appropriate; introduce time-controlled grazing with appropriate rest-rotation schedules; fence key areas there trying to reestablish woody vegetation	M
		Habitat Monitoring and Research	Conduct grazing research and monitor results of grazing changes to determine response in habitat conditions	M

<b>Grassland</b>				
<b>General Threats</b>	<b>Specific Threats</b>	<b>General Conservation Action</b>	<b>Specific Conservation Action</b>	<b>Priority</b>
Development	Direct loss of habitat/habitat fragmentation	Education and Outreach	Educate the public and conservation partners about the consequences of losing grassland habitat	M
		Permanent Conservation of Habitat	Acquire conservation easements or fee-title to key grassland areas	M
		Restore Degraded Habitats	Improve degraded grassland habitats to compensate for areas lost to development	H
		Increase Coordination with Federal/State Agencies, Local Governments, and Private Landowners	Coordinate with agency planners so that management activities enhance, not degrade, important grassland habitats; coordinate habitat management activities with private landowners who own key wildlife habitats	H
Fire Cycle Alteration	Cheatgrass and other non-native species are favored by (and result in) increased fire frequency	Restore Natural Fire Cycle Where Appropriate	Where appropriate, support prescribed burns or other methods to favor native grass species	H
		Restore Degraded Habitats	Where appropriate, support prescribed burns or other methods to favor native grass species	H
Improper Grazing Practices	Over-grazing or grazing at the wrong time of year can greatly degrade the value of habitat for wildlife	Improve Grazing Practices	Change season of use as appropriate; introduce time-controlled grazing with appropriate rest-rotation schedules	M
		Habitat Monitoring and Research	Conduct grazing research and monitor results of grazing changes to determine response in habitat conditions	M
Invasive Plant Species	Cheatgrass and noxious weeds can out-compete desirable plant species	Restore Degraded Habitats	Use herbicides, mechanically remove, or otherwise control invasive non-native vegetation; plant desirable vegetation	H
		Education and Outreach	Educate the public about the negative impacts from cheatgrass	M
		Determine and Map Distribution	Map areas impacted by invasive non-native plant species	M
		Restore Natural Fire Cycle Where Appropriate	Restore natural fire cycle by restoring degraded habitats	H
		Habitat Monitoring and Research	Conduct research into new methods of invasive species control	M

<b>Lowland Riparian</b>				
<b>General Threats</b>	<b>Specific Threats</b>	<b>General Conservation Action</b>	<b>Specific Conservation Action</b>	<b>Priority</b>
Channelization	Increased water velocity	Restore Degraded Habitats	Add meander to streams and plant desirable vegetation	H
	Lack of riparian vegetation			
	Increased sedimentation			
Development	Direct loss of habitat/habitat fragmentation	Education and Outreach	Educate the public and conservation partners about the consequences of losing lowland riparian habitat	M
		Permanent Conservation of Habitat	Acquire conservation easements or fee-title to key lowland riparian areas	M
		Restore Degraded Habitats	Improve degraded lowland riparian habitats to compensate for lowland riparian areas lost to development	H
		Determine and Map Distribution	Map the distribution of lowland riparian habitat	H
		Increase Coordination with Federal/State Agencies, Local Governments, and Private Landowners	Coordinate with agency planners so that management activities enhance, not degrade, important lowland riparian habitats; coordinate habitat management activities with private landowners who own key wildlife habitats	H
Drought	Reduced amounts of water available for wildlife	Increase/Secure In-stream Flow	Secure adequate in-stream flow in key lowland riparian habitats	H
	Reduced plant productivity impacts herbivores			
Energy Development	Well pads, roads, and other infrastructure can result in direct loss of habitat and habitat fragmentation	Increase Coordination with Federal/State Agencies, Local Governments, and Private Landowners	Work with land managers to include meaningful long-term habitat mitigation requirements in energy development projects	H
		Support Efficient Energy Development Methods	Support directional drilling, well clustering, and other efficient energy development methods	H
		Restore Degraded Habitats	Improve degraded lowland riparian habitats to compensate for areas lost to energy development	H
		Restore and Conserve Habitat	Support habitat restoration/conservation as mitigation for energy development	H
		Habitat Monitoring and Research	Conduct habitat restoration research and monitor habitat restoration projects to document their success or failure	H
		Determine and Map Distribution	Map the distribution of lowland riparian habitat	H
Fire Cycle Alteration	Increased fire frequency favors invasive plant species	Restore Natural Fire Cycle Where Appropriate	Use herbicides, mechanically remove, or otherwise control invasive non-native vegetation; plant desirable vegetation	H
		Restore Degraded Habitats	Use herbicides, mechanically remove, or otherwise control invasive non-native vegetation; plant desirable vegetation	H
Improper Grazing Practices	Over-grazing by livestock or elk, or grazing at the wrong time of year can greatly degrade the value of habitat for wildlife	Improve Grazing Practices	Change season of use as appropriate; introduce time-controlled grazing with appropriate rest-rotation schedules; fence key areas where trying to reestablish woody vegetation	M
		Habitat Monitoring and Research	Conduct grazing research and monitor results of grazing changes to determine response in habitat conditions	M

Improper OHV Use	Unchecked OHV use results in direct loss of habitat and habitat fragmentation	Enforce Existing OHV Regulations	Strictly enforce OHV regulations; revise OHV regulations as appropriate and necessary	M
	Soil compaction	Education and Outreach	Educate the public about the damage potential of OHVs	M
		Determine and Map Distribution	Map areas impacted by OHVs	M
		Habitat Monitoring and Research	Monitor habitat changes in areas impacted by OHVs	M
		Restore Degraded Habitats	Where appropriate, reclaim areas damaged by OHV use	H
		Increase Coordination with Federal/State Agencies, Local Governments, and Private Landowners	Increase coordination for enforcement of OHV regulations	H
Invasive Plant Species	Tamarisk and other invasive species out-compete desirable plant species	Restore Degraded Habitats	Use herbicides, mechanically remove, or otherwise control invasive non-native vegetation; plant desirable vegetation, including use of non-invasive, non-native species when ecologically indicated to fight invasive annuals	H
		Education and Outreach	Educate the public in ways to avoid the spread of invasive species	M
		Determine and Map Distribution	Map areas impacted by invasive plant species	M
		Habitat Monitoring and Research	Conduct research into new methods of invasive species control	M
Water Development	Reduced amounts of water available for riparian vegetation and wildlife	Increase/Secure In-stream Flow	Secure adequate in-stream flow in key lowland riparian habitats; implement water releases that more closely mimic natural hydrographs	H
	Lack of natural hydrological events, such as seasonal overbank flooding, impairs recruitment of some riparian vegetation	Education and Outreach	Educate the public and conservation partners about the importance of lowland riparian habitats	M

Mountain Riparian				
General Threats	Specific Threats	General Conservation Action	Specific Conservation Action	Priority
Channelization	Increased water velocity	Restore Degraded Habitats	Add meander to streams and plant desirable vegetation	H
	Lack of riparian vegetation			
	Increased sedimentation			
Development	Direct loss of habitat/habitat fragmentation	Education and Outreach	Educate the public and conservation partners about the consequences of losing mountain riparian habitat	M
		Permanent Conservation of Habitat	Acquire conservation easements or fee-title to key mountain riparian areas	M
		Restore Degraded Habitats	Improve degraded mountain riparian habitats to compensate for mountain riparian areas lost to development	H
		Determine and Map Distribution	Map the distribution of mountain riparian habitat	H
		Increase Coordination with Federal/State Agencies, Local Governments, and Private Landowners	Coordinate with agency planners so that management activities enhance, not degrade, important mountain riparian habitats; coordinate habitat management activities with private landowners who own key wildlife habitats	H

Energy Development	Well pads, roads, and other infrastructure can result in direct loss of habitat and habitat fragmentation	Increase Coordination with Federal/State Agencies, Local Governments, and Private Landowners	Work with land managers to include meaningful long-term habitat mitigation requirements in energy development projects	H
		Support Efficient Energy Development Methods	Support directional drilling, well clustering, and other efficient energy development methods	H
		Restore Degraded Habitats	Improve degraded mountain riparian habitats to compensate for mountain riparian areas lost to energy development	H
		Restore and Conserve Habitat	Support habitat restoration/conservation as mitigation for energy development	H
		Habitat Monitoring and Research	Conduct habitat restoration research and monitor habitat restoration projects to document their success or failure	H
		Determine and Map Distribution	Map the distribution of mountain riparian habitat	H
Improper Grazing Practices	Over-grazing by livestock or elk, or grazing at the wrong time of year can greatly degrade the value of habitat for wildlife	Improve Grazing Practices	Change season of use as appropriate; introduce time-controlled grazing with appropriate rest-rotation schedules; fence key areas where trying to reestablish woody vegetation	M
		Habitat Monitoring and Research	Conduct habitat restoration research and monitor habitat restoration projects to document their success or failure	H
Improper OHV Use	Unchecked OHV use results in direct loss of habitat and habitat fragmentation	Enforce Existing OHV Regulations	Strictly enforce OHV regulations; revise OHV regulations as appropriate and necessary	M
		Education and Outreach	Educate the public about the damage potential of OHVs	M
		Determine and Map Distribution	Map areas impacted by OHVs	M
		Habitat Monitoring and Research	Monitor habitat changes in areas impacted by OHVs	M
		Restore Degraded Habitats	Where appropriate, reclaim areas damaged by OHV use	H
		Increase Coordination with Federal/State Agencies, Local Governments, and Private Landowners	Increase coordination for enforcement of OHV regulations	H
Invasive Plant Species	Invasive species out-compete desirable plant species	Restore Degraded Habitats	Use herbicides, mechanically remove, or otherwise control invasive non-native vegetation; plant desirable vegetation, including use of non-invasive, non-native species when ecologically indicated to fight invasive annuals	H
		Education and Outreach	Educate the public in ways to avoid the spread of invasive species	M
		Determine and Map Distribution	Map areas impacted by invasive plant species	M
		Habitat Monitoring and Research	Conduct research into new methods of invasive species control	M
Water Development	Reduced amounts of water available for riparian vegetation and wildlife	Increase/Secure In-stream Flow	Secure adequate in-stream flow in key mountain riparian habitats; implement water releases that more closely mimic natural hydrographs	H
	Lack of natural hydrological events, such as seasonal overbank flooding, impairs recruitment of some riparian vegetation	Education and Outreach	Educate the public and conservation partners about the importance of mountain riparian habitats	M

<b>Mountain Shrub</b>				
<b>General Threats</b>	<b>Specific Threats</b>	<b>General Conservation Action</b>	<b>Specific Conservation Action</b>	<b>Priority</b>
Brush Eradication	Poorly planned brush control activities, such as removal of woody vegetation without promoting sufficient plant diversity or adequate seral stage representation, can destroy important wildlife habitats	Increase Coordination with Federal/State Agencies, Local Governments, and Private Landowners	Coordinate with "fuels management" officers and other fire planners so that brush management activities enhance, not degrade, important mountain shrub habitats; coordinate habitat management activities with private landowners who own key wildlife habitats	H
Energy Development	Well pads, roads, and other infrastructure can result in direct loss of habitat and habitat fragmentation	Increase Coordination with Federal/State Agencies, Local Governments, and Private Landowners	Work with land managers to include meaningful long-term habitat mitigation requirements in energy development projects	H
		Support Efficient Energy Development Methods	Support directional drilling, well clustering, and other efficient energy development methods	H
		Restore Degraded Habitats	Improve degraded habitats to compensate for areas lost to energy development	H
		Restore and Conserve Habitat	Support habitat restoration/conservation as mitigation for energy development	H
		Habitat Monitoring and Research	Conduct habitat restoration research and monitor habitat restoration projects to document their success or failure	H
Fire Cycle Alteration	Increase in plant decadence/pinyon-juniper habitat due to lack of disturbance	Restore Natural Fire Cycle Where Appropriate	Where appropriate, support prescribed burns or other methods to disturb decadent vegetation	H
	Increased fire frequency due to cheatgrass invasion	Restore Degraded Habitats	Improve degraded mountain shrub habitats to compensate for areas lost to development	H
Improper Grazing Practices	Over-grazing or grazing at the wrong time of year can greatly degrade the value of habitat for wildlife	Improve Grazing Practices	Change season of use as appropriate; introduce time-controlled grazing with appropriate rest-rotation schedules	M
		Habitat Monitoring and Research	Conduct habitat restoration research and monitor habitat restoration projects to document their success or failure	H
Invasive Plant Species	Cheatgrass and noxious weeds can out-compete desirable plant species	Restore Degraded Habitats	Use herbicides, mechanically remove, or otherwise control invasive non-native vegetation; plant desirable vegetation, including use of non-invasive, non-native species when ecologically indicated to fight invasive annuals	H
		Education and Outreach	Educate the public about the negative impacts from cheatgrass	M
		Determine and Map Distribution	Map areas impacted by invasive non-native plant species	M
		Restore Natural Fire Cycle Where Appropriate	Implement controlled burns and restore degraded habitats	H
		Habitat Monitoring and Research	Conduct research into new methods of invasive species control	M

<b>Shrubsteppe</b>				
<b>General Threats</b>	<b>Specific Threats</b>	<b>General Conservation Action</b>	<b>Specific Conservation Action</b>	<b>Priority</b>
Brush Eradication	Poorly planned brush control activities, such as removal of woody vegetation without promoting sufficient plant diversity or adequate seral stage representation, can destroy important wildlife habitats	Increase Coordination with Federal/State Agencies, Local Governments, and Private Landowners	Coordinate with "fuels management" officers and other fire planners so that brush management activities enhance, not degrade, important shrubsteppe habitats; coordinate habitat management activities with private landowners who own key wildlife habitats	H



Development	Direct loss of habitat/habitat fragmentation	Education and Outreach	Educate the public and conservation partners about the consequences of losing shrubsteppe habitat	M
		Permanent Conservation of Habitat	Acquire conservation easements or fee-title to key shrubsteppe areas	M
		Restore Degraded Habitats	Improve degraded shrubsteppe habitats to compensate for areas lost to development	H
		Increase Coordination with Federal/State Agencies, Local Governments, and Private Landowners	Coordinate with agency planners so that management activities enhance, not degrade, important shrubsteppe habitats; coordinate habitat management activities with private landowners who own key wildlife habitats	H
Drought	Reduced water results in dead/dying vegetation	Restore Degraded Habitats	Plant desirable vegetation when drought abates	H
Energy Development	Well pads, roads, and other infrastructure can result in direct loss of habitat and habitat fragmentation	Increase Coordination with Federal/State Agencies, Local Governments, and Private Landowners	Work with land managers to include meaningful long-term habitat mitigation requirements in energy development projects	H
		Support Efficient Energy Development Methods	Support directional drilling, well clustering, and other efficient energy development methods	H
		Restore Degraded Habitats	Improve degraded shrubsteppe habitats to compensate for areas lost to energy development	H
		Restore and Conserve Habitat	Support habitat restoration/conservation as mitigation for energy development	H
		Habitat Monitoring and Research	Conduct habitat restoration research and monitor habitat restoration projects to document their success or failure	H
Fire Cycle Alteration	Increase in plant decadence/pinyon-juniper habitat due to lack of disturbance	Restore Natural Fire Cycle Where Appropriate	Where appropriate, support prescribed burns or other methods to disturb decadent vegetation; plant desirable vegetation	H
		Restore Degraded Habitats	Where appropriate, support prescribed burns or other methods to disturb decadent vegetation; plant desirable vegetation	H
Improper Grazing Practices	Over-grazing or grazing at the wrong time of year can greatly degrade the value of habitat for wildlife	Improve Grazing Practices	Change season of use as appropriate; introduce time-controlled grazing with appropriate rest-rotation schedules	M
		Habitat Monitoring and Research	Conduct grazing research and monitor results of grazing changes to determine response in habitat conditions	M
Improper OHV Use	Unchecked OHV use results in direct loss of habitat and habitat fragmentation	Enforce Existing OHV Regulations	Strictly enforce OHV regulations; revise OHV regulations as appropriate and necessary	M
		Education and Outreach	Educate the public about the damage potential of OHVs	M
		Determine and Map Distribution	Map areas impacted by OHVs	M
		Habitat Monitoring and Research	Monitor habitat changes in areas impacted by OHVs	M
		Restore Degraded Habitats	Where appropriate, reclaim areas damaged by OHV use	H
		Increase Coordination with Federal/State Agencies, Local Governments, and Private Landowners	Increase coordination for enforcement of OHV regulations	H

Invasive Plant Species	Cheatgrass and noxious weeds can out-compete desirable plant species	Restore Degraded Habitats	Use herbicides, mechanically remove, or otherwise control invasive non-native vegetation; plant desirable vegetation, including use of non-invasive, non-native species when ecologically indicated to fight invasive annuals and restore the natural fire cycle	H
		Education and Outreach	Educate the public about the negative impacts from cheatgrass	M
		Determine and Map Distribution	Map areas impacted by invasive plant species	M
		Habitat Monitoring and Research	Conduct research into new methods of invasive species control	M

<b>Water - Lentic (standing)</b>				
<b>General Threats</b>	<b>Specific Threats</b>	<b>General Conservation Action</b>	<b>Specific Conservation Action</b>	<b>Priority</b>
Dam Safety	Unsafe dams may be breached, resulting in a loss of lentic habitat	Properly Maintain Existing Dams	Support the efforts necessary to maintain dams that provide key lentic habitats	L
Drought	Reduced amounts of water available for wildlife	Permanent Conservation of Habitat	Secure conservation pools in key lentic habitats	M
Environmental Contamination	Contaminants, such as mercury, can accumulate in fish in polluted waters	Control and Monitor Contaminants	Support the pollution-reduction efforts of the EPA, DEQ, and other agencies	L
Invasive Animal Species	Habitat alteration by carp or invasive aquatic mollusks	Education and Outreach	Educate the public and conservation partners about ways to prevent the spread of invasive animal species	M
		Restore Degraded Habitats	Temporarily drain some small impoundments to reduce or eliminate invasive species	L
Invasive Plant Species	Invasive aquatic plant species, such as Eurasian watermilfoil, reduce the value of lentic habitats for some species	Education and Outreach	Educate the public in ways to avoid the spread of invasive species	M
		Determine and Map Distribution	Map areas impacted by invasive non-native plant species	M
		Habitat Monitoring and Research	Conduct research into new methods of invasive species control	M
		Restore Degraded Habitats	Temporarily drain some small impoundments to reduce or eliminate invasive species	L
Nutrient Enrichment/Sediment Loading	Eutrophication and excess silt levels reduce habitat value	Restore Degraded Habitats	Add meander to streams above key lentic habitats; disturb decadent vegetation and plant desirable vegetation above key lentic habitats	H
		Improve Grazing Practices	Implement rest-rotation grazing/fence cattle out of stream channels above key lentic habitats	M
		Modify Agricultural Practices	Reduce fertilizer use near eutrophic lentic habitats	M
Water Development	Reduced amounts of water available for wildlife	Permanent Conservation of Habitat	Secure adequate conservation pools in key lentic habitats	M
		Education and Outreach	Educate the public and conservation partners about the importance of lentic habitats	M

<b>Water - Lotic (flowing)</b>				
<b>General Threats</b>	<b>Specific Threats</b>	<b>General Conservation Action</b>	<b>Specific Conservation Action</b>	<b>Priority</b>
Channelization	Increased water velocity	Restore Degraded Habitats	Add meander to streams and plant desirable vegetation	H
	Lack of riparian vegetation			
	Increased sedimentation			
Development	Direct loss of habitat/habitat fragmentation	Education and Outreach	Educate the public and conservation partners about the consequences of losing lotic habitat	M
		Increase/Secure In-stream Flow	Secure in-stream flow in key lotic habitats	H
		Restore Degraded Habitats	Improve degraded lotic habitats to compensate for lotic areas lost to development	H
		Increase Coordination with Federal/State Agencies, Local Governments, and Private Landowners	Coordinate with agency planners so that management activities enhance, not degrade, important lotic habitats; coordinate habitat management activities with private landowners who own key wildlife habitats	H
Drought	Reduced amounts of water available for wildlife	Increase/Secure In-stream Flow	Secure adequate in-stream flow in key lotic habitats	H
Energy Development	Well pads, roads, and pipelines can result in increased sedimentation	Increase Coordination with Federal/State Agencies, Local Governments, and Private Landowners	Work with land managers to include meaningful long-term habitat mitigation requirements in energy development projects	H
		Support Efficient Energy Development Methods	Support directional drilling, well clustering, and other efficient energy development methods	H
		Restore Degraded Habitats	Improve degraded habitats to compensate for areas lost to energy development	H
		Restore and Conserve Habitat	Support habitat restoration/conservation as mitigation for energy development	H
		Habitat Monitoring and Research	Conduct habitat restoration research and monitor habitat restoration projects to document their success or failure	H
Environmental Contamination	Contaminants, such as mercury, can accumulate in fish in polluted waters	Control and Monitor Contaminants	Support the pollution-reduction efforts of the EPA, DEQ, and other agencies	L
Improper Grazing Practices	Over-grazing can increase sedimentation and decrease water quality	Improve Grazing Practices	Introduce time-controlled grazing with appropriate rest-rotation schedules	M
		Habitat Monitoring and Research	Conduct grazing research and monitor results of grazing changes to determine response in habitat conditions	M
Improper OHV Use	Unchecked OHV use results in direct loss of habitat and habitat fragmentation	Enforce Existing OHV Regulations	Strictly enforce OHV regulations; revise OHV regulations as appropriate and necessary	M
		Education and Outreach	Educate the public about the damage potential of OHVs	M
		Determine and Map Distribution	Map areas impacted by OHVs	M
		Habitat Monitoring and Research	Monitor habitat changes in areas impacted by OHVs	M
		Restore Degraded Habitats	Where appropriate, reclaim areas damaged by OHV use	H
		Increase Coordination with Federal/State Agencies, Local Governments, and Private Landowners	Increase coordination for enforcement of OHV regulations	H
Invasive Animal Species	Habitat alteration by carp or invasive aquatic mollusks	Education and Outreach	Educate the public and conservation partners about ways to prevent the spread of invasive animal species	M
Invasive Plant Species	Thick stands of tamarisk can reduce the amount of flowing water in a stream, narrow channels, exclude native	Restore Degraded Habitats	Use herbicides, mechanically remove, or otherwise control invasive non-native vegetation; plant desirable vegetation, including use of non-invasive, non-native species when ecologically indicated to fight invasive annuals	H

	species, and modify natural fluvial geomorphic processes	Education and Outreach	Educate the public in ways to avoid the spread of invasive species	M
		Determine and Map Distribution	Map areas impacted by invasive plant species	M
		Habitat Monitoring and Research	Conduct research into new methods of invasive species control	M
Nutrient Enrichment/Sediment Loading	Eutrophication and excess silt levels reduce habitat value and may prohibit successful breeding of some fish species	Restore Degraded Habitats	Add meander to streams; disturb decadent vegetation and plant desirable vegetation	H
		Improve Grazing Practices	Implement rest-rotation grazing; fence cattle out of stream channel	H
		Modify Agricultural Practices	Reduce fertilizer use near eutrophic lotic habitats	M
Water Development	Reduced amounts of water available for wildlife	Increase/Secure In-stream Flow	Secure adequate in-stream flow in key lotic habitats	H
		Education and Outreach	Educate the public and conservation partners about the importance of lotic habitats	M

Wet Meadow				
General Threats	Specific Threats	General Conservation Action	Specific Conservation Action	Priority
Development	Direct loss of habitat/habitat fragmentation	Education and Outreach	Educate the public and conservation partners about the consequences of losing wet meadow habitat	M
	Draining	Permanent Conservation of Habitat	Acquire conservation easements or fee-title to key wet meadow areas	M
	Vegetation treatments that remove desirable plant species	Restore Degraded Habitats	Improve degraded wet meadow habitats to compensate for areas lost to development	H
		Increase Coordination with Federal/State Agencies, Local Governments, and Private Landowners	Coordinate with agency planners so that management activities enhance, not degrade, important wet meadow habitats; coordinate habitat management activities with private landowners who own key wildlife habitats	H
Drought	Drought typically results in a reduction of wet meadow habitat	Increase/Secure In-stream Flow	Secure in-stream flow in streams functionally connected to key wet meadows	H
Improper Grazing Practices	Over-grazing or grazing at the wrong time of year can greatly degrade the value of habitat for wildlife	Improve Grazing Practices	Change season of use as appropriate; introduce time-controlled grazing with appropriate rest-rotation schedules	M
		Habitat Monitoring and Research	Conduct grazing research and monitor results of grazing changes to determine response in habitat conditions	M
Improper OHV Use	Unchecked OHV use results in direct loss of habitat and habitat fragmentation	Enforce Existing OHV Regulations	Strictly enforce OHV regulations; revise OHV regulations as appropriate and necessary	M
	Soil compaction	Education and Outreach	Educate the public about the damage potential of OHVs	M
		Determine and Map Distribution	Map areas impacted by OHVs	M
		Habitat Monitoring and Research	Monitor changes in areas impacted by OHVs	M
		Restore Degraded Habitats	Reclaim areas damaged by OHV use where appropriate	H
		Increase Coordination with Federal/State Agencies, Local Governments, and Private Landowners	Increase coordination for enforcement of OHV regulations	H
Loss of Adjacent Uplands	The loss of adjacent upland habitats may impact wetland function and greatly reduce the value of wetland habitats for wildlife	Permanent Conservation of Habitat	Acquire conservation easements or fee-title to key wet meadows or important upland areas that are adjacent to key wet meadows	M
		Restore Degraded Habitats	Improve degraded upland habitats adjacent to key wet meadow habitats to compensate for uplands lost/degraded from development	M

Water Development	Reduced amounts of water available for wetland vegetation and wildlife	Increase/Secure In-stream Flow	Secure in-stream flow in streams functionally connected to key wet meadows	H
		Education and Outreach	Educate the public and conservation partners about the importance of wet meadow habitats	M

Wetland				
General Threats	Specific Threats	General Conservation Action	Specific Conservation Action	Priority
Development	Direct loss of habitat/habitat fragmentation	Education and Outreach	Educate the public and conservation partners about the consequences of losing wetland habitat	M
	Draining	Permanent Conservation of Habitat	Acquire conservation easements or fee-title to key wetland areas	M
	Vegetation treatments that remove desirable plant species	Restore Degraded Habitats	Improve degraded wetland habitats to compensate for wetlands lost to development	H
		Increase Coordination with Federal/State Agencies, Local Governments, and Private Landowners	Coordinate with agency planners so that management activities enhance, not degrade, important wetland habitats; coordinate habitat management activities with private landowners who own key wildlife habitats	H
Drought	Reduced amounts of water available for wildlife	Increase/Secure In-stream Flow	Secure in-stream flow in streams functionally connected to key wetlands	H
	Reduced plant productivity impacts herbivores			
Energy Development	Well pads, roads, and pipelines can result in habitat loss, habitat fragmentation, and increased sedimentation	Increase Coordination with Federal/State Agencies, Local Governments, and Private Landowners	Work with land managers to include meaningful long-term habitat mitigation requirements in energy development projects	H
		Support Efficient Energy Development Methods	Support directional drilling, well clustering, and other efficient energy development methods	H
		Restore Degraded Habitats	Improve degraded wetland habitats to compensate for wetland areas lost to energy development	H
		Restore and Conserve Habitat	Support habitat restoration/conservation as mitigation for energy development	H
		Habitat Monitoring and Research	Conduct habitat restoration research and monitor habitat restoration projects to document their success or failure	H
Environmental Contamination	Contaminants, such as selenium, accumulate in wetlands and can negatively impact wildlife populations	Control and Monitor Contaminants	Support the pollution-reduction efforts of the EPA, DEQ, and other agencies	L
Improper Grazing Practices	Over-grazing or grazing at the wrong time of year can greatly degrade the value of habitat for wildlife	Improve Grazing Practices	Change season of use as appropriate; introduce time-controlled grazing with appropriate rest-rotation schedules	M
		Habitat Monitoring and Research	Conduct grazing research and monitor results of grazing changes to determine response in habitat conditions	M
Invasive Plant Species	Tamarisk, purple loosestrife, and other invasive species out-compete desirable plant species	Restore Degraded Habitats	Use herbicides, mechanically remove, or otherwise control invasive non-native vegetation; plant desirable vegetation, including use of non-invasive, non-native species when ecologically indicated to fight invasive annuals	H
		Education and Outreach	Educate the public in ways to avoid the spread of invasive species	M
		Determine and Map Distribution	Map areas impacted by invasive plant species	M
		Habitat Monitoring and Research	Conduct research into new methods of invasive species control	M

Loss of Adjacent Uplands	The loss of adjacent upland habitats may impact wetland function and greatly reduce the value of wetland habitats for wildlife	Permanent Conservation of Habitat	Acquire conservation easements or fee-title to important upland areas that are adjacent to key wetlands	M
		Restore Degraded Habitats	Improve degraded upland habitats adjacent to key wetland habitats to compensate for uplands lost/degraded from development	H
Water Development	Reduced amounts of water available for wetland vegetation and wildlife	Increase/Secure In-stream Flow	Secure in-stream flow in streams functionally connected to key wetlands	H
		Education and Outreach	Educate the public and conservation partners about the importance of wetland habitats	M

## **PRIORITY HABITAT RESEARCH AND SURVEY NEEDS**

The quality of Utah's habitat GIS data is currently being improved through the Southwest Regional GAP project, which should be completed during 2005. Future Utah habitat mapping needs will depend upon the accuracy of Southwest Regional GAP final habitat data. However, because of the resolution of GAP data (30 square meters), it is anticipated that some small habitats, such as narrow riparian areas, may be underrepresented. Accordingly, the mapping of small mountain riparian and lowland riparian habitats throughout Utah will be a high survey priority. In addition, as discussed in Chapter 7, the identification of conservation focus areas in each of the 10 key habitats is a priority task that will be completed within two years of CWCS ratification. The UDWR will also continue its statewide long-term shrubsteppe habitat condition surveys (see <http://www.wildlife.utah.gov/range/> for details).

The primary research goal is to determine the impacts of CWCS habitat restoration activities on species and habitats. Research is necessary to determine which habitat restoration activities produce the best habitat conditions and result in enhanced species populations. With proper research, restoration actions that are not effective can be modified or abandoned, effective techniques can be improved, and new techniques can be tested. The UDWR is currently working cooperatively with Utah State University to conduct research on the effects of shrubsteppe habitat restoration activities in northern Utah. Research will be conducted on other key habitats as conservation and restoration activities in those habitats are implemented.

## **RELATIVE PRIORITY OF HABITAT CONSERVATION ACTIONS**

Conservation actions that 1) increase coordination with government agencies, local governments, and private landowners, and 2) restore degraded habitats within identified conservation focus areas and therefore benefit species of conservation need, will be given the highest priority. As recent habitat restoration work on Utah's shrubsteppe habitats has shown (see "Implementation of Habitat Conservation Actions" section below), there is a strong commitment on the part of UDWR and its partners to work cooperatively. Because of this strong desire, the demonstrated need for habitat restoration, and the cooperative nature of the restoration activities, large-scale habitat restoration efforts in Utah have an excellent chance for success.

## **IMPLEMENTATION OF HABITAT CONSERVATION ACTIONS**

Utah has already begun a large-scale effort to restore important wildlife habitats. The partnership driving this conservation effort is known as the Utah Partners for Conservation and Development (UPCD), an organization that represents state and federal natural resource agencies, universities, county and local governments, private landowners, conservation organizations, and vested stakeholders. The UPCD's organizational infrastructure and guiding principles are outlined in a joint resolution (Appendix M) signed in 2004 and supported by all participants and Utah's governor. The resolution and charter identify the long-term need to address the risks to our natural resources and develop a shared vision. The charter also sets priorities for: 1) restoration and management, 2) leveraging technical and financial resources, and 3) improving communication and cooperation among participants and stakeholders. The partnership effort includes a statewide core team and five regional teams that represent the participant agencies, organizations, and vested interests.

The UPCD is represented at four different levels of organization: 1) UPCD Director's Council, 2) UPCD Statewide Core Team, 3) five Regional Teams, and 4) Local Conservation Workgroups. Top administrators of agencies meet regularly as the UPCD Director's Council to discuss and address national and statewide conservation and environmental issues.

#### **UPCD Director's Council**

Utah Dept. of Natural Resources	Utah Dept. of Agriculture & Food
U.S. Bureau of Land Management	U.S.D.A. Forest Service
Utah State University Extension Service	Utah Dept. of Environmental Quality
U.S.D.A. Natural Resources Conservation Service	Utah RC&D Councils Association
Utah Association of Conservation Districts	U.S. Bureau of Reclamation
U.S. Fish & Wildlife Service	U.S. National Park Service
U.S. Farm Services Agency	Utah School & Inst. Trust Lands

Each member of the Council has a representative in the state-level group (Statewide Core Team), which also includes representatives from organizations such as The Nature Conservancy and The Audubon Society. The Statewide Core Team meets regularly to monitor the effectiveness of each agency and organization in the partnership, share information about new programs, discuss issues, and address resource allocation needs.

Five regional teams (Northern, Central, Northeastern, Southeastern, and Southern), made up of UPCD representatives and other stakeholders in conservation, such as local conservation organizations, county officials, and landowners, are in place to discuss regional priority conservation areas, identify potential projects, and pool the resources (funding, technical assistance, and logistic support) necessary to accomplish restoration projects. In addition, the regional teams serve as a clearinghouse for conservation priorities and are developing three to five-year conservation plans for restoration and conservation activities that include measurable goals, objectives, and targets. The regional teams collaboratively develop program work plans and site-specific projects and budgets. Local conservation work groups operate at a watershed or soil conservation district level and identify local conservation concerns and develop local conservation strategies to meet local needs, while achieving regional and statewide conservation goals.

Current UPCD habitat restoration efforts center on the shrubsteppe habitat conservation focus areas identified in Chapter 7. To better guide these efforts, the UPCD will develop goals, objectives, and targets for each focus area by establishing three integrally related teams: management, science, and conservation outreach. The management team will ensure that the implementation of conservation priorities contained in wildlife and habitat restoration plans (including the CWCS) are systematically and consistently coordinated with other plans, such as Forest Management Plans, BLM Resource Management Plans, and species recovery plans. The science team will ensure that accurate and reliable information is available to managers and decision makers, and the conservation outreach team will develop an efficient and effective system for reporting and disseminating information.



These teams will be tasked with addressing the following questions:

1. What will be conserved or restored?
2. What scale is needed?
3. Where should it be done?
4. How should it be done?
5. Who among conservation partners can best carry out the different elements of the effort?
6. How will the effectiveness of actions be monitored, evaluated, and demonstrated?
7. How will communities of practice initiate and sustain conservation stewardship?

Through the work of these teams, individual projects will be designed and implemented to address targets with measurable objectives. The process required to take a project from inception to implementation will take at least 18 months, with project plans and budgets developed during year one, and environmental clearances and project implementation occurring in year two. The 18-month (or longer) timeframe for project implementation allows for collaborative planning among statewide program coordinators, regional teams, various levels of government, conservation organizations, and landowners. It also better ensures the availability of adequate resources and appropriate coordination, including development of a post-project monitoring strategy.

### **Preliminary Results and Future Efforts**

The UPCD's habitat restoration activities have been successful thus far because of systematic and consistent collaboration among conservation partners. Although still in its early stages, the UPCD restored more than 23,000 acres of shrubsteppe habitat during 2004. In 2005, the UPCD was considering 66 project proposals, for a total of \$5,600,000, to restore 86,000 acres of shrubsteppe habitat. Because of this demonstrated success, the UPCD's organizational structure and collaborative effort to restore shrubsteppe habitats serve as a prototype for implementing the conservation actions identified in the CWCS for other key habitats. It is hoped that the UPCD will soon begin to discuss and restore lowland riparian, mountain riparian, aspen, and other key habitats, in addition to its continued work on shrubsteppe habitats. As work in other key habitats begins, the UPCD will coordinate its efforts with additional stakeholders, such as the Blue Ribbon Fisheries Advisory Council, fisheries advocates, the Habitat Council, and various species conservation and recovery programs.

## **CHAPTER 9 . ADAPTIVE MANAGEMENT AND MONITORING**

(Elements 5 and 6)

In this chapter, we present a framework for adapting our conservation actions in response to new information and changing conditions. Adaptive Management is a tool that promotes continual improvement of species conservation through learning from both successful and unsuccessful management actions. To be successful, adaptive management must contain a monitoring component that assesses species and habitat responses to management actions while simultaneously measuring environmental conditions that may confound monitoring results. It also requires a mechanism that enhances learning and facilitates change in response to what is learned.

### **THE CRITICAL ELEMENTS – PLAN, IMPLEMENT, MONITOR**

Simply defined, adaptive management is the adjustment or modification of management to achieve a desired conservation objective. In practice, true adaptive management is a complex process that should include both sound experimental design components and a systematic process that includes a feedback loop linking monitoring to management (Figure 9-1; Moir and Block 2001, Aldridge et al. 2004). Adaptive management requires flexibility, but the adaptive management approach should be well structured and predetermined. The Comprehensive Wildlife Conservation Strategy (CWCS) will be used as a guideline as ongoing conservation actions are implemented and new actions are developed so that study design, evaluation, and adaptive management are more thoroughly integrated into Utah Division of Wildlife Resources (UDWR) projects.

Key steps in the adaptive management process are 1) determine the desired conservation objective, 2) formulate a predictive model (or suite of models) that represents potential changes in the system resulting from a management action (or suite of actions), 3) based on predictions (i.e., hypotheses) from the model, implement the apparently appropriate management action(s) to meet the objective, and 4) monitor the results to determine if the management action(s) resulted in the desired outcome. Based on results, the models are revised (if necessary), and the process is repeated. These steps and methods are discussed by Walters 1986, Johnson et al. 1997, Moir and Block 2001, and Williams et al. 2001.

Setting objectives and developing predictive models stimulate organization and formalize rigorous thinking about the management issue and potential solutions. In effect, the model estimates benefits for each alternative action, based on the associated risks, so that the chosen action should provide the maximum benefit. Monitoring provides the critical link between implementing conservation actions and revising management objectives (Figure 9-1). The absence of correctly conducted monitoring leads to the failure of adaptive management, as the critical feedback loops needed to understand the costs, benefits, and effectiveness of management are severed (Moir and Block 2001).

When well-designed, adaptive management can provide an alternative to the formal experiments normally conducted in scientific investigations (Block et al. 2001). Adaptive management has the strongest inference (widest applicability) when experimental design components are incorporated into the monitoring process; for example random selection of study areas (or animals), random assignment of treatments (including controls) over space and time, and replication should all be considered in adaptive management monitoring designs. However,

in some situations, rigorous experimental design procedures can be relaxed without invalidating monitoring results.

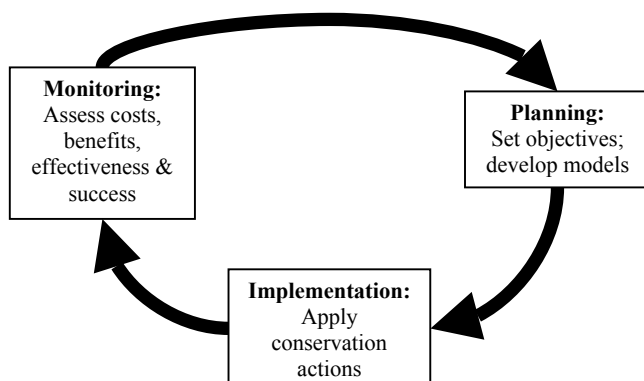


Figure 9-1. Adaptive Management Cycle

## SETTING CONSERVATION OBJECTIVES

Setting measurable objectives is the first critical step in adaptive management. Objectives need to be set first at the statewide level; after these are set, focus area objectives that complement statewide objectives should be developed (focus areas are discussed in chapters 7 and 8). In setting objectives at all levels, the cultural landscape should be considered; human activities are integral to conservation actions and stakeholder concerns will need to be considered in objective development. Setting statewide objectives requires significant thought before any action is taken; much of this “up-front thought process” has been accomplished through development of the CWCS and other planning efforts. For example, the Utah Avian Conservation Strategy (UTACS; Parrish et al. 2002) sets measurable habitat and population objectives for several avian species and most species recovery plans set measurable population objectives. However,

Such objectives, however, remain to be set for the majority of Utah’s CWCS species. For the species and habitat types that lack objectives, we propose using a process similar to The Nature Conservancy’s Viability Worksheet process (TNC 2000, Parrish et al. 2003). In this process, key ecological factors and measurable indicators for those factors are defined. Categories (usually Poor, Fair, Good, Very Good) are established for the indicators. Then the current and desired conditions, along with dates associated with these conditions, are determined.

As a hypothetical example, a Key Ecological Factor for sage-grouse may be productivity (number of young per nest) with nest success being an indicator of that factor. Nest success of below 35% might be considered Poor, 35-49% would be Fair, 50-69% would be Good and 70% or above would be Very Good. For example, the current condition (hypothetically as of 1 January 2005) may be Fair with the target condition of Good set for 1 January 2015. There could be several Key Ecological Factors and each may have one or more measurable indicators.

The UDWR and the Utah Nature Conservancy are currently gathering background information and defining ecological factors, measurable indicators, and condition categories on

more than 100 Tier I and Tier II species. When this is complete, these groups will set statewide objectives with timelines for those species and habitats identified in the CWCS. Then UDWR and its partners can determine how best to meet those objectives through local projects.

## FORMULATING MODELS

In order to develop a management system that allows for evaluation of inputs and outcomes in relation to management objectives and conditions, we will consider 3 adaptive management model approaches for each management issue (Figure 9-2). Funding availability will largely determine which approach is actually implemented in each situation. In the Trial and Error approach (Figure 9-2.A.), a single action is modeled, implemented, and monitored; if the action is successful, the status quo is maintained. If the action is not successful, a new model is developed and an alternative action is implemented and monitored. This is the least desirable approach, but may be required when time and funding are limited. In the Step-wise approach (Figure 9-2.B.) a preferred conservation action is implemented but one or more alternatives are available if the preferred action fails. If such failure occurs, “plan B” goes into effect; the success of this action is then monitored and assessed. This approach requires less “up-front” funding than our third approach but may not identify the most effective conservation action. In the Horse Race approach (Figure 9-2.C.), two or more alternative actions are proposed *a priori* and are implemented at the same time. A distinct advantage of this approach is that monitoring results can be directly compared through either a traditional statistical approach (e.g., analysis of variance) or with an information-theoretic approach to model comparisons (Burnham and Anderson 2001). The Horse Race approach is the most desirable because of its strong design and because it allows comparison of several actions across space and time. Its disadvantage is the up-front cost; however, this may be offset in the long run by the efficiency of testing several actions at once.

Currently we do not have all of the information required to build data-driven adaptive management models for all species and habitats across the state. As part of the CWCS process, UDWR has determined what information we have, what information we lack and what conservation actions and monitoring techniques are or could be in place. Through this process we have also identified gaps in information that need to be filled in order to create reliable adaptive management models. This lack of information can be temporarily overcome by developing a qualitative (or semi-quantitative) adaptive management model based on the information that we do have. And, as information gaps are filled, we will refine our model to be more quantitative and specific (Holling 1978).

## IMPLEMENTING ACTIONS

Monitoring should occur for both new and ongoing management. Research information, previously collected monitoring data, population or ecological models, and even anecdotal information may indicate that changes in management appear warranted. If new management is proposed, it should be thoroughly described so that it can be implemented and monitored effectively.

Management actions should be developed based on our knowledge of ecology and biology as well as current ecological conditions. This also requires a practical knowledge of what

techniques are most likely to work under a variety of conditions. Communication between those with theoretical knowledge and those with practical knowledge is essential.

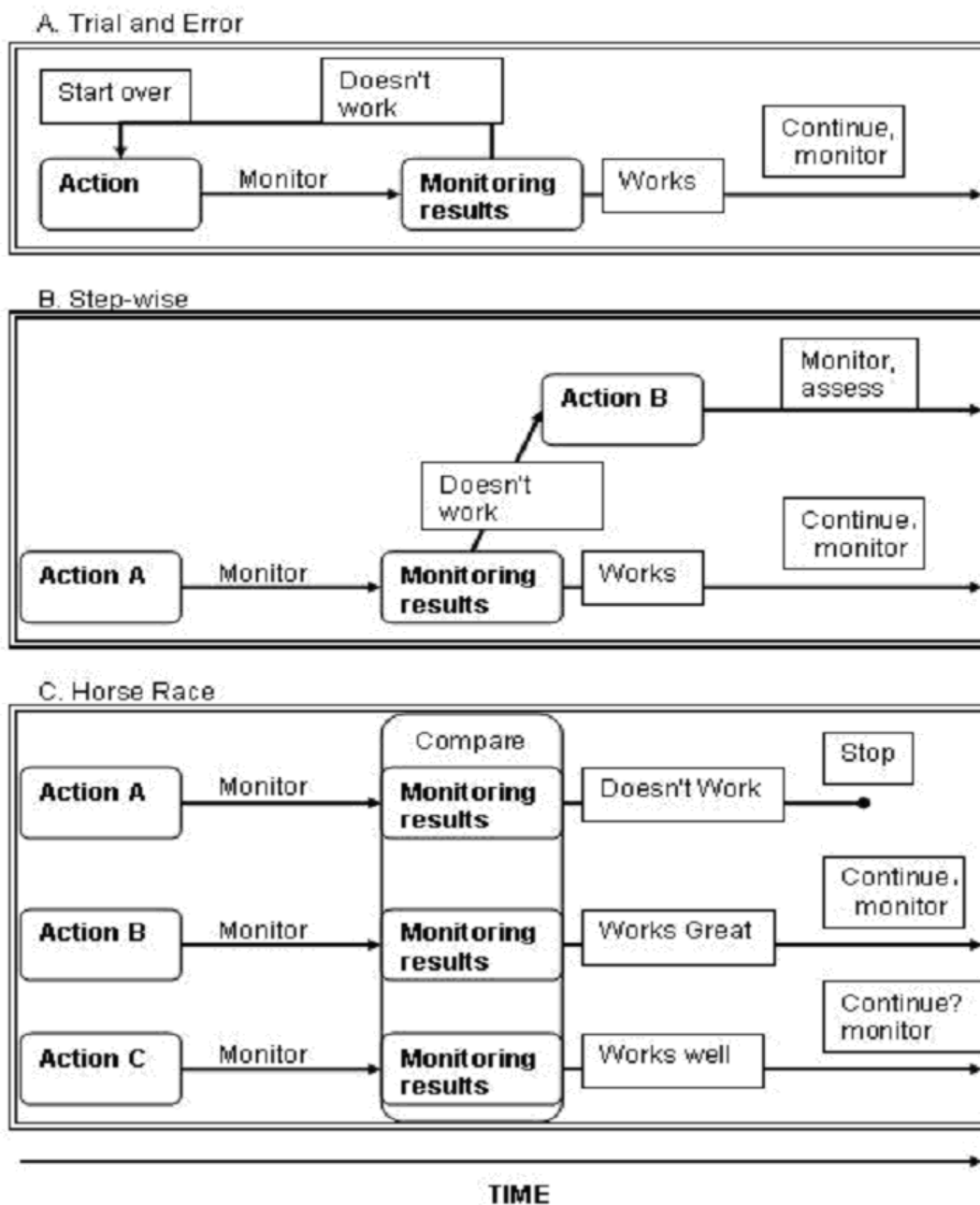


Figure 9-2. Adaptive Management Model Approaches

Implementation of management actions requires knowledge of what options (tools) are available and how much each costs; successful implementation also involves communication with the public and specific user groups. Implementation, particularly of new management actions, may require overcoming resistance to change; small scale tests and a commitment to monitor effects of new techniques may provide sufficient momentum to overcome resistance.

## **MONITORING**

UDWR currently monitors animal species to determine population status, distribution, and productivity. UDWR also monitors wildlife habitats to determine the health of plant communities that are important to wildlife. These monitoring data are then used to assess the effectiveness of management actions. Monitoring is primarily conducted at two levels: 1) the individual species level and 2) the habitat type or community level. Monitoring activities are included in management documents such as recovery plans, conservation agreements, habitat conservation plans, and other species management plans involving interagency partnerships. (A comprehensive list of active management plans for CWCS species can be found in Chapter 4.)

Monitoring is critical to understanding and quantifying the impacts of management actions. While what to monitor will be dictated during the adaptive management process, in most cases we will want to monitor one or all of the following: 1) target species responses, 2) habitat responses, 3) prey responses, 4) non-target species responses, and 5) public/stakeholder understanding, acceptance and support. Target and non-target species responses may include presence/absence, population density, productivity (number of offspring), breeding success, offspring and adult survival, use of treated areas, etc. Prey response may be a change in prey density, prey availability and prey utilization by target species or a change in prey utilization of habitat. Habitat responses are monitored using vegetation monitoring techniques which yield information directly applicable to the habitat of the species of interest.

For comparatively well-studied species, monitoring protocols have been described, often in great detail, in recovery plans, conservation plans, published literature and gray literature; UDWR will use these if available. If no established protocol exists, UDWR will adapt protocols from similar species or develop its own protocols based on what is known about the species. In developing protocols, we will develop 1) a narrative describing how monitoring results will be used in management, 2) a list of standard operating procedures describing data collection, training requirements and the process for protocol revision, and 3) supplementary materials such as databases, statistical tools, maps and geographic information systems to be used (Oakley et al. 2003). If little is known about a species (e.g., the Tier III species) an inventory must first be conducted to determine whether or not the species can be found in anticipated habitats (e.g., presence/absence surveys). Repeated surveys over time are usually necessary to confirm absence. Once presence is determined, the breeding status and density or relative abundance of the species will be evaluated using species-specific monitoring protocols (either standardized or developed by UDWR). When presence data are assembled, complete distributions of the species, along with population conditions can be mapped and used to direct future efforts. When combined with habitat data, this information can be used to develop predictive habitat models and maps to help focus future efforts.

## Setting Monitoring Objectives

Monitoring objectives should logically follow the management objectives. If, for example, the management objective was to increase sage-grouse productivity by increasing nesting habitat, then monitoring objectives should include measuring nesting habitat and the number of sage-grouse young produced. As with setting overall adaptive management objectives, monitoring objectives should be set first at the statewide level and then at the project level. While project level objectives will necessarily vary by project, such objectives must be compatible enough to insure that monitoring data is comparable among projects.

Monitoring objectives should be measurable; there should be a measure of the species or habitat (indicator) of interest as well as a measure of the amount of acceptable error (variance). For example, an objective to monitor a project designed to increase sage-grouse populations might be to measure annual sage-grouse density with sample size and technique sufficient to detect 25% change over 10 years. Until measurable monitoring objectives are developed, it is not possible to effectively design a monitoring project, determine the appropriate factors and indicators to measure, or determine what data gathering techniques to use.

## Species monitoring

Species monitoring activities conducted by UDWR may be subdivided into two general categories: population monitoring and assessment monitoring.

*Population monitoring* – Population monitoring is a general technique designed to detect prevailing population trends by monitoring individual species or species groups over time (Thompson et al. 1998). This type of monitoring allows UDWR to determine if populations are increasing, decreasing or stable, and then take appropriate management actions in order to preclude the necessity of federal listing. In most cases, habitat data are also collected and correlated with population information. Examples of population monitoring projects include the statewide survey of landbirds in riparian habitats (Howe 1996), shorebird and waterbird surveys on the Great Salt Lake (Paul and Manning 2002), population monitoring of Virgin River fishes (UDWR 2002a), Colorado pikeminnow population monitoring (Bestgen et al. 2004) statewide waterfowl surveys (UDWR 2002b), and river otter monitoring (Maxfield et al. 2005). At times, large-scale changes in the environment can be correlated with this type of monitoring data, though population monitoring is not specifically designed to provide information on cause and effect. Examples of monitoring techniques used for CWCS species are listed in Appendix J.

*Assessment monitoring* – Assessment monitoring (also termed project monitoring or objective-based monitoring) is the monitoring of species responses to management changes at the project (or several project) level. Elzinga et al. (2001) defines it as the collection and analysis of repeated observations to evaluate changes in condition and progress toward meeting a management objective. This type of monitoring allows UDWR to assess impacts of management actions and modify these actions to maximize the desired effect on species and populations. For example, UDWR is evaluating responses of endangered native fish species to removal of nonnative smallmouth bass populations (Christopherson and Brunson 2005). UDWR is also undertaking major efforts in monitoring wildlife responses to shrubsteppe restoration activities

(Edwards and Howe 2004) and plans to initiate similar broad-scale efforts in riparian project monitoring (Fairchild pers. commun.).

An important subset of assessment monitoring is *implementation monitoring*. When an action is implemented, it is important to evaluate whether the activity has been carried out as designed (Morrison 2002). In other words, it is necessary to determine if the treatment was applied as it was conceptualized and prescribed. Managers must be able to evaluate why an action is successful or unsuccessful and gain a clear understanding of what was actually implemented so that future assessments are based on what actually occurred. An example would be monitoring habitat (vegetation) responses to sagebrush treatments (implementation monitoring) in addition to monitoring sage-grouse response to the treatments (assessment monitoring).

*What to measure* – Monitoring factors might include direct measurements of wildlife populations or indirect measures such as population indexes or habitat. Direct measures might include population size, density, population trends, productivity, survival, fitness, and/or demographic factors. Indexes may be substituted for direct population measures; however, these can only be used effectively if the relationship between the index and the population parameter is well understood. Likewise, habitat can be used as a surrogate for direct population measures if the relationship between the habitat and population is well defined (monitoring of key habitats is described below). In many cases, a combination of direct and indirect measures will be appropriate.

### **Monitoring Key Habitats**

Habitats should be monitored when possible in conjunction with species monitoring (Morrison 2002). Because of limited resources and a need to focus our efforts, habitat monitoring will be targeted to areas containing species of the greatest conservation need (Tier I, II, and III species). We will pay particular attention to monitoring areas where habitat restoration activities are planned or have already occurred. This “pre” and “post” habitat treatment monitoring will provide the information needed to determine which habitat restoration activities are successful. We will then be able to modify future treatments for maximum benefit.

*Lowland riparian, mountain riparian, and water (lentic and lotic) habitats* will be monitored through a methodology that considers the condition of the entire hydrologic zone. Although there is not a current statewide riparian inventory in Utah, the UDWR is currently working with the BLM and the USFS to create a riparian vegetation inventory system. In addition to vegetation, our monitoring of the hydrologic zone will include water quality data collected by the Utah Department of Environmental Quality consistent with their Total Maximum Daily Load (TMDL) protocols used to assess degree of water body impairment relative to the intended uses, including wildlife. The Binns HQI method (Binns 1982) is also used to assess aquatic habitat quality, especially in waters managed for trout fishing.

The specific protocols (gear types, vessels, time of day, etc.) used to monitor lentic and lotic aquatic habitats in Utah are dependent on the characteristics of the body of water of interest. Both lentic and lotic (standing and flowing) habitats are usually selectively sampled, i.e., representative sample locations are chosen and, in many cases, regularly monitored. Results are assembled and usually compared to similar samples taken in previous years in order to detect population and/or habitat trends. With time and sufficient data (see below) UDWR anticipates increasingly taking a watershed approach to monitoring aquatic habitats with expansion of the



representative sampling described above. In general we will assume that improvements in the conditions of these habitats will improve the conditions of the species therein. In reservoirs where conservation pools exist, we will monitor and maintain those conservation pools.

Conservation pools are minimum reservoir levels required for conservation of aquatic wildlife.

*Wetland habitats* will be monitored in several ways. Many important Utah wetlands are managed by UDWR as Waterfowl Management Areas (or WMAs). These WMAs are closely monitored and managed by UDWR staff. In addition, UDWR is an active participant in the Intermountain West Joint Venture (IWJV; a public/private partnership dedicated to the conservation of bird habitat in the western states), and we will utilize the wetland focus area monitoring data collected through IWJV activities. Finally, we will utilize available satellite imagery to detect changes in wetland abundance throughout Utah over time. The Utah Coordinated Bird Monitoring Plan (Seglund et al. 2005) has identified several important wetland areas across the state.

*Shrubsteppe, mountain shrub, wet meadow, grassland, and aspen habitats* will be monitored using a modified Daubenmire methodology for estimating herbaceous plant cover (UDWR 1996). Additional methodologies will be employed for monitoring shrub and tree cover. The UDWR has already refined these methodologies, and they have been successfully used to monitor shrubsteppe and other big game habitats throughout Utah for many years (UDWR 1996).

## EXPERIMENTAL AND MONITORING DESIGN

The information provided by well-designed monitoring projects approaches that of formal experiments (Block et al. 2001). Incorporating experimental design components into the monitoring process greatly strengthens the inference (applicability) of the results. For example, design components such as random selection of study areas (or animals), random assignment of treatments (including controls) over space and time, and replication, should all be used whenever possible in adaptive management monitoring. While this cannot always be done, relaxation of some rigorous design procedures will not automatically invalidate the monitoring results. For example, treatments may have been conducted on areas that were not randomly assigned. Data from treated areas and randomly assigned control areas may yield useful information for management purposes. While some design procedures can be relaxed, formalizing predictive models and monitoring management outcomes (i.e., implementation monitoring) are essential to learning about species and habitat conservation using adaptive management.

Controlled experiments may sometimes be desirable where adequate randomization, control, and replication are possible and cost effective. In other cases it may be best to combine true experiments with monitoring to take advantage of the strengths of both processes. Monitoring alone can often provide suitable results. In all situations, the feedback loop from action to result and back to action is critical.

Analyzing monitoring data most effectively will require the use of several techniques including traditional hypothesis testing, as well as less traditional techniques such as information theoretic methods (Burnham and Anderson 2001) and meta-analysis (Franklin and Shenk 1995). In the simplest terms, traditional hypothesis testing can be used to determine whether actions do or do not produce their intended effect; information theoretic analysis allows for model comparisons to determine which competing action performs better at meeting the objective; and

meta-analysis can be used to compare results from similar studies in different areas to achieve broader inference (Johnson 2002).

Our ability to detect treatment effects and make inferences depends on our ability to randomly assign plots, measure differences between control and treatment plots, and collect data before and after treatments are applied. This can be thought of as a continuum from no information to information, providing strong inference on cause and effect (Figure 9-3).

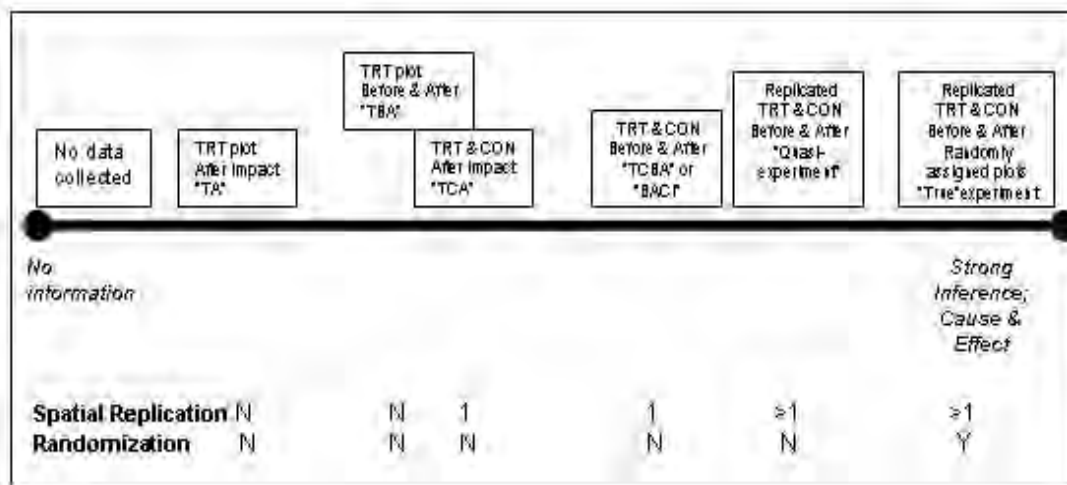


Figure 9-3. Information Continuum and Monitoring Designs.

Designs are indicated in boxes; relative location of "TBA" and "TCA" may shift. Spatial replication is geographic distribution of plots (1 refers to a single replicate CON vs. TRT); temporal replication is distribution of measurements across time. Randomization means treatments (TRT & CON) are randomly assigned to plots. T=Treatment Plot, C=Control Plot, A=After Impact, B=Before Impact.

Ideally, data are collected before and after randomly assigned treatments in several areas undergoing alteration as well as several unaltered or control areas (spatial replication); this is a "true" experiment. A more practical monitoring design which still yields good inference differs from a "true" experiment only in that the treatment and control areas are not randomly assigned (Elzinga et al. 2000, Morrison et al. 2002); this is often referred to a "quasi-experimental" design (Thompson et al. 1998). In cases where only one control and one treatment plot are available, a Before-After-Control-Impact or BACI design (Smith 2002) can be used.

### Geographic Scale of Monitoring

Specific adaptive management objectives and measures will vary with habitat, species, ecoregion, possibly watershed, and, to a lesser extent, project. However, adaptive management will generally take place on two basic scales: the focus area level and the statewide habitat level. Our approach will be to develop a statewide model and divide it into sub-models based on habitat type and/or species. For example, one UDWR objective is to increase sage-grouse populations statewide. This will be accomplished through several individual projects across the state designed to enhance sage-grouse habitat. Each project will be monitored (habitat and sage-

grouse response) and adjusted if project objectives are not met. Results from all individual projects (and additional monitoring data) will be used to evaluate the overall success of the statewide program and adjust that program as needed. Similarly, we have separated Utah's species (Tier I-III) by habitat type and can now develop a management plan for each habitat type.

The same process (plan-implement-monitor-plan) will be used at both the individual project and statewide habitat levels, and for both individual and statewide projects, we will use species (Tier I-III) and habitat responses as the metrics of success. Based on the best available information, preferred conservation actions and a few specific alternatives will be created, i.e. modeled. Monitoring responses to management actions will help inform and direct our decisions on continuing or changing management.

## **DATABASES AND MONITORING**

The Division has developed several databases for tracking various species and habitat monitoring efforts. Although these databases were developed for different purposes, they are all linked through the use of common fields and consistent species and habitat codes. The relational aspect of the Division's databases allows users to easily summarize all work related to a particular species or habitat type. In addition, because these databases are spatial (linked to GIS files), users can also easily summarize all work that has occurred in a particular location.

### **Species Monitoring Databases**

For species of conservation need, the UDWR's management sections have developed numerous detailed monitoring databases to track the distribution and status of species populations over time. Examples of such databases include: the Columbia spotted frog database, which contains information specific to frog monitoring, such as number of egg masses, population size, and wetland habitat conditions; and the Mexican spotted owl database, which contains information specific to raptor monitoring, such as nest location, number of eggs, and number of individuals successfully fledged each year. These databases are continually updated as new field data become available.

Once each year, the information from all UDWR species monitoring databases is imported into the UDWR's central biodiversity database, which currently contains over 21,000 rare species locality records and is managed by the UDWR's Utah Natural Heritage Program. In addition to UDWR data, Utah Natural Heritage Program staff add new species locality records to the central database as data are received from cooperating agencies, such as the U.S. Forest Service and the Bureau of Land Management, museums, universities, and other sources. All data provided to the Utah Natural Heritage Program are quality-controlled and converted to a standard format before they are added to the central biodiversity database. The quality-control process ensures that the data are accurate and reliable, whereas conversion to a standard format allows data from many sources to be easily queried, summarized, and distributed. In addition, because the same standard format is used by Natural Heritage Programs/Conservation Data Centers in all 50 states, most Canadian provinces, and many Latin American countries, the standardization allows data from many jurisdictions to be easily combined into large datasets that cross state and national boundaries. These "multi-jurisdictional" datasets allow for much more effective broad-scale conservation planning.

Although UDWR currently has systems for monitoring species population information (see above) and habitat-related conservation actions (see below), we do not currently track non-habitat conservation actions (e.g., reintroductions, relocations) that are implemented to benefit a particular species. As part of Utah CWCS implementation, the UDWR will develop a database to track non-habitat conservation actions. Once this database is complete, we will be able to quickly answer questions such as: “Which research projects were implemented to benefit greater sage-grouse?”, “How many least chub population surveys were conducted last year?”, or “What conservation actions were taken to benefit pygmy rabbit during the first year of Utah CWCS implementation?” This spatial database will use the same species codes as the UDWR’s other species monitoring databases so that information from all databases can be easily related, queried, and summarized.

### **Habitat Monitoring Databases**

As part of the habitat monitoring efforts described elsewhere in this chapter, the UDWR has developed and refined a spatial database that tracks habitat conditions across time. In addition to this monitoring database, the UDWR has recently developed a database that allows us to track the amount of each habitat type that is restored or protected during Utah CWCS implementation. This database includes such information as habitat-restoration project descriptions, project locations and maps, land ownership, project dates, project sizes, project costs, pre-project and post-project photographs, species benefited, and so on. The combination of these data with habitat monitoring data will allow us to determine what has been accomplished over the course of the Utah CWCS implementation. It will also allow us to document that we are meeting the terms of conservation agreements, species management plans, and cooperative agreements that include obligations to restore or protect set amounts of habitat. Moreover, because this database uses the same codes as the species databases discussed previously, we will be able to summarize all conservation actions (both habitat and non-habitat) implemented for any species or in any particular area.

### **Utah CWCS Master Database**

All of the species and habitat databases discussed above are under the umbrella of the new Utah CWCS Master Database recently developed by the UDWR. This database, which contains the threats and conservation actions identified throughout the Utah CWCS for all species and habitats of conservation need, is linked through species and habitat codes to UDWR’s species and habitat monitoring databases. Through these links, users can identify threats, proposed conservation actions, implemented conservation actions, and species/habitat response for all habitats and species of conservation need throughout the course of Utah CWCS implementation.

## **COMPILING AND ANALYZING MONITORING RESULTS**

Making appropriate use of the data that become available through UDWR activities will be critical to justifying the efforts necessary to collect the data. Assuming that appropriate management questions have been asked, appropriate monitoring has been initiated to answer those questions, and data has been collected and analyzed to support the answers, wildlife and habitat management is incomplete if the conclusions of the monitoring efforts have not been

applied to appropriate modifications of management actions. The UDWR proposes to institute a biennial review process to complete the feedback loop, where conclusions and recommendations are applied to management. While the biennial review is specifically designed to review and assess monitoring information, it is only a part of the overall CWCS review process described in Chapter 11.

Under the biennial review process, UDWR Program Coordinators and their staffs will review the information in their Section Databases on a regular basis for accuracy and completeness, culminating in a comprehensive review every two years. This biennial review will allow for an assessment of conservation priorities within their section. The Program Coordinators will then meet with staff to review the information presented in the CWCS Master Database for accuracy and completeness, updated as appropriate with information from the Section Databases. Following review of the CWCS Master Database the Coordinators will set UDWR's conservation priorities, including what actions are to be taken and how results will be monitored and reported, for the following two-year period. This prioritization will be presented to Section Chiefs, UDWR Administration, and CWCS partners for review and approval. These Master Database reviews and statewide prioritization meetings will be completed, including database update and prioritization report, not later than 1 December in odd numbered years. The first review and prioritization meeting and reporting will be completed not later than 1 December 2007. Biennial review will not only help insure that the CWCS is meaningfully implemented, but will provide needed documentation of progress on a regular basis that can be assembled each decade when the CWCS expires and is due for review and revision.

## **SUCCESSFUL ADAPTIVE MANAGEMENT**

To insure that individual focus area objectives and statewide objectives are similar, the various sections and regions of UDWR will need to communicate effectively. This will be accomplished, in part, by following the CWCS; however, it will also require close communication among those who develop and implement projects (e.g., regional habitat biologists) and those who set statewide objectives (state office program coordinators). UDWR will facilitate this communication through the annual workplan process (see Chapter 10) and through the Habitat Project Database. Communication and cooperation among partners and among agencies in all stages of adaptive management is also critical.

Success at adaptive management will also require periodic compilation of data and re-evaluation of objectives (see above), which will both need to be done at relatively frequent intervals; however, the interval depends in large part on the time it takes species or habitats to respond to conservation actions. For example, sage-grouse may respond to sagebrush cover reduction in one or two years, but songbirds may not respond to riparian tree plantings for nearly a decade. Habitat responses will, in some cases, occur more quickly and provide a strong indicator of management success or need for adaptation.

Long-term adaptive management plans need to be flexible to both political change and environmental change. Changes in administrations often result in changes in funding for monitoring and implementation. For an adaptive management plan to be resilient, it must be based on the best available information and it must be frequently updated with new information. Scientific defensibility is the best insurance for a continually successful adaptive management plan.

In summary, adaptive management is the formal process of formulating predictive models for conservation actions, implementing the actions, monitoring the effects of the actions, then revising the predictive models and beginning again. Adaptive management is an effective tool for continually improving management of CWCS species and habitats. The success of this process relies on effective and continuous communication, effectual database management, and periodic review of monitoring data.

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## **CHAPTER 10 . REVIEW AND UPDATE THE STRATEGY**

(Elements 6, 7 and 8)

### **UTAH’S CWCS REVISION AND ADAPTIVE UPDATE PROCESSES**

#### **Annual Progress**

*One-Year Work Plan Development.*—The Utah Comprehensive Wildlife Conservation Strategy (CWCS) Partner Group will be convened on a yearly basis to review and consider the current status of progress for the year past and year to come. Each Partner will report on its progress toward addressing the threats and conservation actions identified in the CWCS for both species and habitats (i.e., Tables 5.1 and 6.1 respectively). For example, the Utah Division of Wildlife Resources (UDWR) has an internal annual work plan development process for setting project goals and objectives that will be aligned with working toward addressing the CWCS threats and actions specific to priority habitats and species of conservation need.

Similarly, the Utah Partners for Conservation and Development (UPCD) has a Core Team and five Regional Implementation Teams serving as the operational arms of a major, statewide rangeland and watershed habitat restoration program. The UPCD habitat restoration projects identified annually will be assessed and compared with the overall program and will continue to be collaboratively aligned with Utah’s CWCS’ top habitat priorities for conserving, protecting and managing wildlife habitat in rangeland (i.e., shrub-steppe) and watershed (i.e., riparian) areas.

#### **Updates**

*Interim Internal Evaluations.*—UDWR CWCS leaders will determine, through coordination and communication with CWCS partners, whether projected tasks and timelines are consistent with available resources and efforts demonstrated by the CWCS Partner Advisory Group. This may occur as frequently as yearly.

*Biennial Review.*—UDWR Program Coordinators and staff will conduct a comprehensive review of information every two years, which will allow for an assessment of conservation priorities within their sections (Chapter 9). Biennial review will help ensure that the CWCS is meaningfully implemented and will provide documentation of progress that can be referred to when the CWCS is due for revision and review.

#### **Process Framework and Flexibility**

*Partners Scheduled Plan Inputs and Unanticipated Events.*—Whenever scheduled CWCS revisions or unanticipated events occur, all members of the CWCS Partner Advisory Group and UPCD will be advised at the earliest opportunity. Any changes made that will necessarily affect CWCS progress and expectations will be recorded and filed for reference and retrieval purposes. Potential revisions will be addressed by all Partners on an as needed, agreed upon basis.

## **5-year Horizon**

*Adjusting the Course Mid-Stream.*—Following the first four years of CWCS implementation, we will assess our conservation efforts under the CWCS by identifying where we have made progress and where we have yet to progress sufficiently toward our 10-year Horizon outcomes. Preliminary trend data will be prepared by the CWCS Partner Advisory Group (including UPCD Teams and the UDWR CWCS Team) for analysis, discussion and redirection. Such redirection will reflect the ecological realities and projected trends after the first four years. This collaborative assessment will ensure that, six months in advance of the expiration of the first 5-year Horizon, we are prepared to make public recommendations for the second 5-Year Horizon and modify our expectations for the 10-year Horizon accordingly.

## **10-year Horizon**

*Re-Focusing on the Long Term Direction.*—In order to fulfill the requirement of assessing and revising the CWCS, a comprehensive assessment will be conducted to critically review accomplishments relative to eight elements of the CWCS one year prior to its expiration. The UDWR CWCS Team, UPCD Teams and the CWCS Partner Advisory Group will assess and present findings, as well as identify and prepare recommendations for the next CWCS.

Six months prior to the expiry of the 10-year Strategy, a formal release of a draft of the Utah Comprehensive Wildlife Conservation Strategy: The 2<sup>nd</sup> Decade, will be routed to all interested public and potentially affected interests for their review, comment and suggestions. Recommendations of merit shall be incorporated and the CWCS Partner Advisory Group will again present the revised, composite version of the Strategy to the Resource Development Coordinating Council, the five UDWR Regional Advisory Councils and the Utah Wildlife Board for approval/acceptance. Should there be another, similar federal submittal requirement as per the development of this inaugural Strategy, our specified timeline will be appropriately altered to also meet with its deadline and stipulations for submittal.

## **CHAPTER 11 . ACKNOWLEDGEMENTS**

The Utah Division of Wildlife Resources (UDWR) wishes to acknowledge and thank various public and private contributors to this document. UDWR also recognizes the support received from the Utah Department of Natural Resources in accomplishing this initial endeavor toward implementing the Comprehensive Wildlife Conservation Strategy (CWCS) statewide. Similarly, we wish to thank those members of the public who contributed to the formulation of this strategy and encourage their continued commitment toward the long term, sustainable management and protection of our state's fish and wildlife species and habitats of greatest conservation need.

Finally, we are indebted to the many UDWR staff that gave of their time, expertise and passion to ensure that Utah's fish and wildlife, as well as their habitats, are managed in a sustainable manner for future generations. For a brief period of time, we were fortunate to have a visionary leader and valued colleague, the late Director Kevin Conway, guide us in the development of this Strategy. We will always remember his spirit and dedication. The next generation of leaders and employees are determined to make a positive difference and the CWCS will serve as an instrumental tool toward effecting successful conservation in Utah.

### **CWCS Partner Advisory Group Representatives**

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Clint McCarthy, Brad Shafer and Brian Ferebee, USDA Forest Service  
Steve Madsen, USDI Bureau of Land Management  
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Debbie Goodman, Audubon  
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Brock Richardson, Trout Unlimited  
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Other UDWR Salt Lake and Regional personnel were also instrumental in our completion of the CWCS. To all those who are unnamed, we thank each of you for your invaluable contributions.

## **APPENDICES**

## **APPENDIX A . WILDLIFE DEFINITIONS FROM UTAH CODE**

### **Utah Code Annotated 1953/TITLE 23 WILDLIFE RESOURCES CODE /CHAPTER 13 GENERAL**

#### **PROVISIONS /23-13-2. Definitions.**

#### **23-13-2. Definitions.**

##### **Statute text**

##### **As used in this title:**

- (1) "Activity regulated under this title" means any act, attempted act, or activity prohibited or regulated under any provision of Title 23 or the rules, and proclamations promulgated thereunder pertaining to protected wildlife including:
  - (a) fishing;
  - (b) hunting;
  - (c) trapping;
  - (d) taking;
  - (e) permitting any dog, falcon, or other domesticated animal to take;
  - (f) transporting;
  - (g) possessing;
  - (h) selling;
  - (i) wasting;
  - (j) importing;
  - (k) exporting;
  - (l) rearing;
  - (m) keeping;
  - (n) utilizing as a commercial venture; and
  - (o) releasing to the wild.
- (2) "Aquatic animal" has the meaning provided in Section 4-37-103.
- (3) "Aquatic wildlife" means species of fish, mollusks, crustaceans, aquatic insects, or amphibians.
- (4) "Aquaculture facility" has the meaning provided in Section 4-37-103.
- (5) "Bag limit" means the maximum limit, in number or amount, of protected wildlife that one person may legally take during one day.
- (6) "Big game" means species of hoofed protected wildlife.
- (7) "Carcass" means the dead body of an animal or its parts.
- (8) "Certificate of registration" means a document issued under this title, or any rule or proclamation of the Wildlife Board granting authority to engage in activities not covered by a license, permit, or tag.
- (9) "Closed season" means the period of time during which the taking of protected wildlife is prohibited.
- (10) "Conservation officer" means a full-time, permanent employee of the Division of Wildlife Resources who is POST certified as a peace or a special function officer.
- (11) "Dedicated hunter program" means a program that provides:

- (a) expanded hunting opportunities;
  - (b) opportunities to participate in projects that are beneficial to wildlife;
  - and
  - (c) education in hunter ethics and wildlife management principles.
- (12) "Division" means the Division of Wildlife Resources.
- (13) (a) "Domicile" means the place:
- (i) where an individual has a fixed permanent home and principal establishment;
  - (ii) to which the individual if absent, intends to return; and
  - (iii) in which the individual, and the individual's family voluntarily reside, not for a special or temporary purpose, but with the intention of making a permanent home.
- (b) To create a new domicile an individual must:
- (i) abandon the old domicile; and
  - (ii) be able to prove that a new domicile has been established.
- (14) "Endangered" means wildlife designated as such pursuant to Section 3 of the federal Endangered Species Act of 1973.
- (15) "Fee fishing facility" has the meaning provided in Section 4-37-103.
- (16) "Feral" means an animal which is normally domesticated but has reverted to the wild.
- (17) "Fishing" means to take fish or crayfish by any means.
- (18) "Furbearer" means species of the Bassariscidae, Canidae, Felidae, Mustelidae, and Castoridae families, except coyote and cougar.
- (19) "Game" means wildlife normally pursued, caught, or taken by sporting means for human use.
- (20) (a) "Guide" means a person who receives compensation or advertises services for assisting another person to take protected wildlife.
- (b) Assistance under Subsection (20)(a) includes the provision of food, shelter, or transportation, or any combination of these.
- (21) "Guide's agent" means a person who is employed by a guide to assist another person to take protected wildlife.
- (22) "Hunting" means to take or pursue a reptile, amphibian, bird, or mammal by any means.
- (23) "Intimidate or harass" means to physically interfere with or impede, hinder, or diminish the efforts of an officer in the performance of the officer's duty.
- (24) "Nonresident" means a person who does not qualify as a resident.
- (25) "Open season" means the period of time during which protected wildlife may be legally taken.
- (26) "Pecuniary gain" means the acquisition of money or something of monetary value.
- (27) "Permit" means a document, including a stamp, which grants authority to engage in specified activities under this title or a rule or proclamation of the Wildlife Board.
- (28) "Person" means an individual, association, partnership, government agency, corporation, or an agent of the foregoing.

- (29) "Possession" means actual or constructive possession.
- (30) "Possession limit" means the number of bag limits one individual may legally possess.
- (31) (a) "Private fish installation" means a body of water where privately owned, protected aquatic wildlife are propagated or kept.
- (b) "Private fish installation" does not include any aquaculture facility or fee fishing facility.
- (32) "Private wildlife farm" means an enclosed place where privately owned birds or furbearers are propagated or kept and which restricts the birds or furbearers from:
- (a) commingling with wild birds or furbearers; and
- (b) escaping into the wild.
- (33) "Proclamation" means the publication used to convey a statute, rule, policy, or pertinent information as it relates to wildlife.
- (34) (a) "Protected aquatic wildlife" means aquatic wildlife as defined in Subsection (3), except as provided in Subsection (34)(b).
- (b) "Protected aquatic wildlife" does not include aquatic insects.
- (35) (a) "Protected wildlife" means wildlife as defined in Subsection (49), except as provided in Subsection (35)(b).
- (b) "Protected wildlife" does not include coyote, field mouse, gopher, ground squirrel, jack rabbit, muskrat, and raccoon.
- (36) "Released to the wild" means to be turned loose from confinement.
- (37) (a) "Resident" means a person who:
- (i) has been domiciled in the state of Utah for six consecutive months immediately preceding the purchase of a license; and
- (ii) does not claim residency for hunting, fishing, or trapping in any other state or country.
- (b) A Utah resident retains Utah residency if that person leaves this state:
- (i) to serve in the armed forces of the United States or for religious or educational purposes; and
- (ii) complies with Subsection (37)(a)(ii).
- (c) (i) A member of the armed forces of the United States and dependents are residents for the purposes of this chapter as of the date the member reports for duty under assigned orders in the state if the member:
- (A) is not on temporary duty in this state; and
- (B) complies with Subsection (37)(a)(ii).
- (ii) A copy of the assignment orders must be presented to a wildlife division office to verify the member's qualification as a resident.
- (d) A nonresident attending an institution of higher learning in this state as a full-time student may qualify as a resident for purposes of this chapter if the student:
- (i) has been present in this state for 60 consecutive days immediately preceding the purchase of the license; and
- (ii) complies with Subsection (37)(a)(ii).
- (e) A Utah resident license is invalid if a resident license for hunting, fishing, or trapping is purchased in any other state or country.



(f) An absentee landowner paying property tax on land in Utah does not qualify as a resident.

(38) "Sell" means to offer or possess for sale, barter, exchange, or trade, or the act of selling, bartering, exchanging, or trading.

(39) "Small game" means species of protected wildlife:

(a) commonly pursued for sporting purposes; and

(b) not classified as big game, aquatic wildlife, or furbearers and excluding turkey, cougar, and bear.

(40) "Spoiled" means impairment of the flesh of wildlife which renders it unfit for human consumption.

(41) "Spotlighting" means throwing or casting the rays of any spotlight, headlight, or other artificial light on any highway or in any field, woodland, or forest while having in possession a weapon by which protected wildlife may be killed.

(42) "Tag" means a card, label, or other identification device issued for attachment to the carcass of protected wildlife.

(43) "Take" means to:

(a) hunt, pursue, harass, catch, capture, possess, angle, seine, trap, or kill any protected wildlife; or

(b) attempt any action referred to in Subsection (43)(a).

(44) "Threatened" means wildlife designated as such pursuant to Section 3 of the federal Endangered Species Act of 1973.

(45) "Trapping" means taking protected wildlife with a trapping device.

(46) "Trophy animal" means an animal described as follows:

(a) deer - any buck with an outside antler measurement of 24 inches or greater;

(b) elk - any bull with six points on at least one side;

(c) bighorn, desert, or rocky mountain sheep - any ram with a curl exceeding half curl;

(d) moose - any bull;

(e) mountain goat - any male or female;

(f) pronghorn antelope - any buck with horns exceeding 14 inches; or

(g) bison - any bull.

(47) "Waste" means to abandon protected wildlife or to allow protected wildlife to spoil or to be used in a manner not normally associated with its beneficial use.

(48) "Water pollution" means the introduction of matter or thermal energy to waters within this state which:

(a) exceeds state water quality standards; or

(b) could be harmful to protected wildlife.

(49) "Wildlife" means:

(a) crustaceans, including brine shrimp and crayfish;

(b) mollusks; and

(c) vertebrate animals living in nature, except feral animals.

## **APPENDIX B . STATE WILDLIFE GRANTS**

### **115 STAT. 414 PUBLIC LAW 107-63**

#### **State Wildlife Grants (*Including Rescission of Funds*)**

For wildlife conservation grants to States and to the District of Columbia, Puerto Rico, Guam, the United States Virgin Islands, the Northern Mariana Islands, American Samoa, and federally recognized Indian tribes under the provisions of the Fish and Wildlife Act of 1956 and the Fish and Wildlife Coordination Act, for the development and implementation of programs for the benefit of wildlife and their habitat, including species that are not hunted or fished, \$85,000,000 to be derived from the Land and Water Conservation Fund, to remain available until expended, and to be for the conservation activities defined in Section 250( c)(4)(E) of the Balanced Budget and Emergency Deficit Control Act of 1985, as amended, for the purposes of such Act: Provided, That of the amount provided herein, \$5,000,000 is for a competitive grant program for Indian tribes not subject to the remaining provisions of this appropriation: Provided further, That the Secretary shall, after deducting said \$5,000,000 and administrative expenses apportion the amount provided herein in the following manner: (A) to the District of Columbia and to the Commonwealth of Puerto Rico, each a sum equal to not more than one-half of one percent thereof; and (B) to Guam, American Samoa the United States Virgin Islands, and the Commonwealth of the Northern Mariana Islands, each a sum equal to not more than one-fourth of 1 percent thereof: Provided further, That the Secretary shall apportion the remaining amount in the following manner: (A) one-third of which is based on the ratio to which the land area of such State bears the total land area of all such States; and (B) two-thirds of which is based on the ratio to which the population of such State bears to the total population of such States: Provided further, That the amounts apportioned under this paragraph shall be adjusted equitably so that no State shall be apportioned a sum which is less than 1 percent of the amount available under apportionment under this paragraph for any fiscal year or more than 5 percent of such amount: Provided further, That the Federal share of planning grants shall not exceed 75 percent of the total costs of such projects and the Federal share of implementation projects shall not exceed 50 percent of the total costs of such projects: Provided further, That the non-Federal share of such projects shall not be derived from Federal grant programs: Provided further: That no State, territory or other jurisdiction shall receive a grant unless it has developed or committed to develop by October 1, 2005, a comprehensive wildlife conservation plan, consistent with criteria established by the Secretary of the Interior, that considers the broad range of the State, territory, or other jurisdiction's wildlife and associated habitats, with appropriate priority placed on those species with greatest conservation need and taking into consideration the relative level of funding available for the conservation of these species: Provided further, That any amount apportioned in 2002 to any State, territory, or other jurisdiction that remains unobligated as of September 30, 2003, shall be reapportioned, together with funds appropriated in 2004, in the manner provided herein.

Of the amount appropriated in title VII of Public Law 106-291, \$25,000,000 for State Wildlife Grants are rescinded.

NOTE: As of the passage of the above law, Utah's land area in square miles totaled 84,904 [according to the U.S. Statistical Abstract (Census Bureau) 1997], its population was 2,233,169 (as of April 1, 2001, U.S. Census Bureau) and the "anticipated apportionment for FY02 was \$1,090,005.

## **APPENDIX C . CWCS STAKEHOLDERS**

### **FEDERAL AGENCIES**

#### BUREAU OF LAND MANAGEMENT

Steve Madsen  
P.O. Box 45155,  
Salt Lake City, UT 84145-0155  
E-mail: [Steve\\_C\\_Madsen@ut.blm.us](mailto:Steve_C_Madsen@ut.blm.us)  
Phone: 801-539-4058

#### U.S. Air Force

Marcus Blood, OALC Hill AFB EMNR  
OO-ALC/EMP 7274 Wardleigh Road  
Hill AFB, UT 84056  
E-mail: [Marcus.Blood@HILL.af.mil](mailto:Marcus.Blood@HILL.af.mil)  
Phone: 801-777-4618

#### U.S. Army

Steve Plunkett, Wildlife Biologist  
Environmental Programs – Natural Resources  
Commander of the U.S. Army, Dugway Proving Ground  
CSTE-DTC-DP-EP-CP (Attn: Steve Plunkett), Dugway, UT 84022-50000  
E-mail: [plunkett@dpg.army.mil](mailto:plunkett@dpg.army.mil)  
Phone: 435-831-3576  
Fax 435-831-3563

#### U.S. Bureau of Reclamation - Upper Colorado Region

Rick Gold, Regional Director  
125 South State Street, Room 6107  
Salt Lake City, UT 84138-1102  
[www.usbr.gov/uc/](http://www.usbr.gov/uc/)  
phone: 801-524-3600  
fax: 801-524-5499

#### U.S.D.A. Forest Service

Forest Supervisors  
Region 4 Integrated Resource Workshop  
Clint McCarthy  
Ogden District  
E-mail: [cmccarthy01@fs.fed.us](mailto:cmccarthy01@fs.fed.us)  
phone: 801-625-5671  
fax: 801-625-5756

U.S.D.A. Natural Resources Conservation Service

Sylvia Gillen, State Conservationist  
Wallace F. Bennett Federal Building  
125 South State Street, Room 4402  
Salt Lake City, UT 84138-1100  
E-mail: [Sylvia.Gillen@ut.usda.gov](mailto:Sylvia.Gillen@ut.usda.gov)  
Phone: 801-524-4550  
Fax: 801-524-4403

U.S. Fish and Wildlife Service

Bear River Migratory Bird Refuge  
Al Trout, Refuge Manager  
58 South 950 West  
Brigham City UT 84302  
E-mail: [bearriver@fws.gov](mailto:bearriver@fws.gov)  
Phone: 435-723-5887

**STATE**

Governor's Office for Planning and Budget

Mike Hansen, Director of Planning  
Suite 210 of the Utah State Capitol Complex,  
East Office Building, Suite E210, P.O. Box 142210  
Salt Lake City, Utah 84114-2210  
E-mail: [mhansen1@utah.gov](mailto:mhansen1@utah.gov)  
Phone: 801-538-1027  
Fax: 801-538-1547

Utah Association of Conservation Districts

1860 North 100 East  
Logan Utah 84341-1784  
Phone: 435-753-6029 ext. 8  
Fax: 435-755-2117

Utah Dept of Agriculture and Food

K. N. "Jake" Jacobson  
Soil Conservation Program Specialist  
Marketing & Conservation Division  
UT Dept of Agriculture and Food  
P.O. Box 146500,  
Salt Lake City, 84114-6500  
Email: [JakeJacobson@utah.gov](mailto:JakeJacobson@utah.gov)  
Phone: 801-538-7171  
Fax: 801-538-4940

Utah Department of Environmental Quality

Walt Baker, Acting Executive Director  
168 North, 1950 West  
Salt Lake City, UT 84114-4810  
Phone: 801-538-6088

Utah Department of Transportation (UDOT)

Paul West, Environmental Services  
Wildlife Program Manager  
E-mail: [PAULWEST@utah.gov](mailto:PAULWEST@utah.gov)  
Phone: 801-965-4672

Utah Quality Growth Commission

Dan Lofgren, Chair  
Shauna Kerr, Vice Chair

Utah Reclamation Mitigation and Conservation Commission

Michael Weland, Executive Director  
102 West 500 South #315  
Salt Lake City, UT 84101  
E-mail: [mweland@uc.usbr.gov](mailto:mweland@uc.usbr.gov)  
Phone: 801-524-3146

Utah School and Institutional Trust Lands Administration

Kim Christy, Assistant Director, Surface Lands  
675 East 500 South, Suite 500  
Salt Lake City, UT 84102  
Phone: 801-538-5100  
Fax: 801-355-0922

Utah Travel Council

Stacey Clark, Strategic Plan Coordinator  
Phone: 801-538-1373  
Margaret Godfrey, Interagency Cooperative Program Coordinator  
Phone: 801-538-1479  
Dave Williams; Research & Website Development  
Phone: 801-538-1317  
300 North State  
Salt Lake City, UT 84114  
Phone: 801-538-1900

## **NATIVE AMERICAN TRIBES**

### Navajo Nation Department of Fish and Wildlife

Jeff Cole, Wildlife Manager  
Box 1480 Window Rock, AZ 86515  
Phone: 928-871-7068  
Fax: 928-871-7069

### Paiute Tribe of Utah

Lora Tom, Tribal Chairwoman  
440 North Paiute Drive  
Cedar City, UT 84720  
Phone: 435-586-1112

### Ute Tribe Fish & Game Department

Karen Corts or Jaimie Cuch  
901 South 6500 East, PO Box 190  
Ft. Duchesne, UT 84026  
[kcorts@ubtanet.com](mailto:kcorts@ubtanet.com)  
Phone: 435-722-5511  
435-722-5511 X412

## **LOCAL**

### Bear River Association of Governments

(Counties: Box Elder, Cache, Rich)  
Roger Jones  
170 North Main, Room 2  
Logan, UT 84321  
Phone: 435-752-7242

### Five County Association of Governments

(Counties: Beaver, Garfield, Iron, Kane, Washington)  
John Williams  
1070 W 1600S  
St. George, UT 84770  
Phone: 435-673-3548

### Mountainland Association of Governments

(Counties: Summit, Utah, Wasatch)  
Darrell Cook  
586 East 800 North  
Orem, UT 84097-4146  
Phone: 801-229-3800

Southeastern Utah Association of Governments

(Counties: Carbon, Emery, Grand, San Juan)

Bill Howell

375 South Carbon Ave

Price, UT 84501

E-mail: [bhowell@seualg.dst.ut.us](mailto:bhowell@seualg.dst.ut.us)

Phone: 435-637-5444

Six County Association of Governments

(Counties: Juab, Millard, Piute, Sanpete, Sevier, Wayne)

Russell Cowley

250 North Main

Richfield, UT 84701

Phone: 435-896-9222

Uintah Basin Association of Governments

(Counties: Daggett, Duchesne, Uintah)

Laurie Brummand

152 E 100 N, Vernal, Utah

Phone: 435-722-4518

Utah Association of Counties

Brent Gardner, Executive Director

5397 South Vine Street

Murray, UT 84107

[bgardner@uacnet.org](mailto:bgardner@uacnet.org)

Phone: 801-265-1331

Fax: 801-265-9485

Utah League of Cities and Towns

50 South 600 East, Suite 150,

Salt Lake City, UT 84102

Phone: 801-328-1601

Toll free: 800-852-8528

Fax: 801-531-1872

Utah Resource Conservation & Development Councils

Nels Werner

Email: [Nelswerner@mindspring.com](mailto:Nelswerner@mindspring.com)

Phone: 435-686-2590

Utah Soil Conservation Commission

Jake Jacobsen, Staff

Utah Department of Agriculture and Food



Utah Water Users Workshop

Utah Water Users Board of Directors;  
Chair, Bob Hill, USU Irrigation Specialist  
Eric Millis, Div Water Resources:  
Phone: 801-538-7298

Wasatch Front Regional Council

(Counties: Davis, Morgan, Salt Lake, Tooele, Weber)  
George Ramjoue  
295 N. Jimmy Doolittle Road  
Salt Lake City, UT 84116  
Phone: 801-363-4350

Wasatch Front Regional Council, Regional Growth Committee

Mayor David Connors, Chair  
295 North Jimmy Doolittle Road  
Salt Lake City, Utah 84116  
[www.wfrc.org](http://www.wfrc.org)  
Phone: 801 363-4250  
George Ramjoue, WFRC Staff contact  
E-mail: [gramjoue@wfrc.org](mailto:gramjoue@wfrc.org)  
Phone: 363-4230 ext. 111

**NONGOVERNMENTAL ORGANIZATIONS**

Boulder Regional Group

Julian Hatch  
Lynne Mitchell  
PO Box 1365  
Boulder, UT 84716  
E-mail: [brgutah@yahoo.com](mailto:brgutah@yahoo.com)  
Phone: 435-335-7477

Envision Utah

Ted Knowlton, Planning Manager  
E-mail: [tknowlton@cuf-envision.org](mailto:tknowlton@cuf-envision.org)  
Phone: 801-303-1458

Hawk Watch International

Sherry Meyer, Conservation Scientist  
Thom Benedict, Education Director  
1800 S. West Temple, Suite 226  
Salt Lake City, UT 84115  
801-484-6808 or 1-800-726-HAWK  
E-mail: [hwi@hawkwatch.org](mailto:hwi@hawkwatch.org)  
E-mail: [tbenedict@hawkwatch.org](mailto:tbenedict@hawkwatch.org)  
Phone: 801-484-6808 ext. 111  
Fax: 801-484-6810

Rocky Mountain Elk Foundation

Bill Christensen, Regional Director  
3277 W. 11880 S.  
Riverton, UT 84065  
E-mail: [bcrmf@aros.net](mailto:bcrmf@aros.net)  
Phone: 801-254-1922  
Fax: 801-446-8780

Southern Utah Wilderness Association

Bob Brister, Outreach Coordinator  
Steve Bloch, Executive Director  
1471 South 1100 East  
Salt Lake City, UT 84105  
E-mail: [bob@suwa.org](mailto:bob@suwa.org)  
Phone: 801-486-3161 ext. 12

Sportsmen for Fish & Wildlife

Don Peay  
4477 Sunset Circle  
Bountiful, UT 84010-5885  
E-mail: [don@sfwsfh.org](mailto:don@sfwsfh.org)  
Phone: 801-635-5576

Utah Chapter American Planning Association

Chuck Klingenstein, President  
c/o Jones & Stokes  
PO Box 680097  
Park City, UT 84068  
E-mail: [cpk@sisna.com](mailto:cpk@sisna.com)  
Phone: 435-649-1057  
Fax: 435-649-3368

Utah Environmental Congress

1817 So. Main St, Suite 10  
Salt Lake City, Utah 84115  
E-mail [uec@aros.net](mailto:uec@aros.net)  
Phone: 801-466-4055  
Fax: 801-466-4057

Utah Cattlemen's Association

Brent Tanner, Executive Vice President  
150 S 600 E Ste 10B  
Salt Lake City, UT 84102-1961  
Email: [utahbeef@aol.com](mailto:utahbeef@aol.com)  
Phone: 801-355-5748  
Fax: 801-532-1669

Utah Watershed Coordinators Council

Jeff Salt  
Email: [jeffsalt@greatsaltlakekeeper.org](mailto:jeffsalt@greatsaltlakekeeper.org)  
Phone: 801-485-2550

Utah Wool Growers Association

Willis, Clark, President  
1250 N. 1700 E.  
Logan, UT 84341  
E-mail: [clark.willis@comcast.net](mailto:clark.willis@comcast.net)  
Phone: 435-753-1632

Western Wildlife Conservancy

Kirk Robinson  
68 S. Main St. Suite 400  
Salt Lake City, UT, 84101

Wild Utah Project

Allison Jones  
68 S. Main St. Suite 400,  
Salt Lake City, UT, 84101  
Phone: 801-328-3550

## **APPENDIX D . CWCS PRESENTATIONS MADE TO PUBLIC AUDIENCES, STAKEHOLDERS, AND AGENCIES**

*[Staff Presentations Made<sup>1</sup> &/or Information Personally Distributed]*

### **2004**

USFWS – Region Six CWCS Staff Northern Utah Tour of Rangeland & Riparian Projects; 8/18-19/04

Wildlife Section Staff Annual Wildlife (statewide) Section Mtg., Utah Division of Wildlife Resources, Fillmore, Utah; 9/8/04

Aquatics Section Staff (statewide) Annual Aquatics Section Mtg., Utah Division of Wildlife Resources, St. George, Utah; A. Clark; 9/21/04

National Association of Counties - Western Interstate Region Conference; Ogden, UT; 5/27/2004

American Planning Association – Utah Chapter; SLC, UT; 9/22-24/2004\*

Wasatch Front Regional Council – Regional Growth Committee; SLC, UT; 9/30/2004\*

USDA Natural Resources Conservation Service Leadership/Partners; SLC, UT; 10/20/2004

Utah Society for Environmental Education; SLC, UT; 10/21-22/2004

USDI Fish & Wildlife Ecoregional Planning Workshop: Upper Colorado River Basin & Utah Study Area; Grand Junction, CO; 10/26- 27/2004

Utah Farm Bureau's Threatened & Endangered Species Task Force – statewide meeting of county representatives; SLC, UT; 10/26/2004 (Rory Reynolds)

Utah Association of Conservation Districts Annual Conference; 11/2-3/2004, SLC, UT; (Rory Reynolds/Dean Mitchell)

Utah Governor's Office of Planning & Budget – Critical Lands Project Staff; 11/18/2004, SLC, UT\*

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<sup>1</sup> All presentations, unless another staff person is named, were made by Mr. Dana E. Dolsen, CWCS Coordinator and Wildlife Planning Manager, Utah Division of Wildlife Resources

\* Information distributed; presentation not made.

South Eastern Utah Association of Governments; Price, UT; 11/18/2004 (Dana Dolsen & Paul Birdsey, SER Aquatics Manager)

KCPW Public Affairs Hour (National Public Radio @ 1010 AM, 88.3 FM and 105.3 FM) WEDNESDAY, NOVEMBER 24, 2004 [Interview at 9:10 a.m.]  
<http://www.kcpw.org/public-affairs-hour.php>

Uintah Basin Association of Governments; Vernal, UT; 12/03/2004

Utah Division of Wildlife Resources, Salt Lake Office Staff; 12/13/04

## **2005**

Utah Dept. of Transportation – Environmental Section Managers; SLC, UT; 01/06/05 @ 8:45 a.m.

Rich County Coordinated Resource Management meeting; Utah State University, Logan, UT; 1/7/05 @ 10 a.m.\*

Sagebrush Restoration Initiative Teams – Orientation Workshop; 01/11/2005; Red Lion Hotel, Salt Lake City

Utah Farm Bureau (UFB) Sensitive Species Task Force – Box Elder County; 01/18/2005 Tremonton

Utah Anglers' Coalition – 01/19/2005; DNR, SLC

UFB Sensitive Species Task Force – Cache Co., 1/21/2005\*; Logan

Wild Utah Project, SUWA, Western Wildlife Conservancy - 01/21/2005; SLC

Utah Soil Conservation Commission/Districts – 01/25/05; SLC

Utah Quality Growth Commission – 1/26/2005; SLC

Utah Reclamation Mitigation and Conservation Commission - 01/27/05; SLC

Utah Farm Bureau Sensitive Species Task Force – Morgan Co., 01/27/2005; Morgan, UT

Utah Resource Conservation & Development Association Annual Meeting, 02/01/05; Utah State Valley College, Orem

United States Army – Environmental Program, Steve Plunkett; 02/01/05; Dugway Proving Ground

Utah Cooperative Wildlife Management Unit Association, 02/03/05; Lee Kay Center,

SLC

Utah Farm Bureau Sensitive Species Task Force, Tooele Co.; 02/17/2005; Tooele

U.S. Air Force, Utah Range Planning & Programming Board; 02/24/05; SLC

USFS Forest Supervisors' Meeting, 03/02/05, SLC

Utah Farm Bureau Sensitive Species Task Force, Carbon Co.; 03/03/2005; Price

US BLM Southeast District Meeting, 03/08/05; Moab

US BLM Southeast District Meeting, 03/11/05; Price

State Watershed Council, 03/22/05; Richfield (Rory Reynolds)

US BLM Southeast District Meeting, 03/24/05; Kanab (Jim Parrish)

US BLM Southeast District Meeting, 03/29/05; Richfield

USFS Region 4 Integrated Resource Workshop "Working Together Towards Healthy Forests", Topic 30 – Rm. 5: 1:00 p.m., 04/12/2005; Ogden

Utah Chapter American Planning Association – Spring Conference: "Planning in Utah's Rural Communities: Enhancing the Rural Quality of Life through Planning," 05/06/05; Torrey

Six County Association of Governments, 06/01/05; Richfield

Five County Association of Governments, County Commission Chambers, Kane County Courthouse, 06/08/05; Kanab

BLM District Planner's Meeting, 06/09/05; Richfield

Utah Cattlemens' Association, Executive Committee Meeting, 6/22/2005; Salt Lake City

Mountainland Association of Governments, 06/23/05; Orem

Navajo Tribe Fish and Wildlife Department, 06/30/05; Farmington, NM

Bear Lake Association of Governments, 07/27/05; Gardner, ID

Utah Wool Growers Association Annual Meeting, 9/02/05; Park City, UT

Utah League of Cities & Towns Annual Meeting, 9/14-16/2005; Salt Lake City

Wasatch Front Regional Council Regional Growth Committee, 9/15/05; Salt Lake City

Wasatch Front Regional Council, 9/22/05; Salt Lake City

Great Salt Lake Audubon, 09/20/05; Salt Lake City

Utah Association of Counties, Public Lands Committee, 11/2005; Salt Lake City

## **APPENDIX E . REGIONAL ADVISORY COUNCILS**

### **Utah Code Annotated 1953/TITLE 23 WILDLIFE RESOURCES CODE /CHAPTER 14-2.6, Regional Advisory Councils**

#### Statute text

- (1) There are created five regional advisory councils which shall consist of 12 to 15 members each from the wildlife region whose boundaries are established for administrative purposes by the division.
- (2) The members shall include individuals who represent the following groups and interests:
  - (a) agriculture;
  - (b) sportsmen;
  - (c) nonconsumptive wildlife;
  - (d) locally elected public officials;
  - (e) federal land agencies; and
  - (f) the public at large.
- (3) The executive director of the Department of Natural Resources, in consultation with the director of the Division of Wildlife Resources, shall select the members from a list of nominees submitted by the respective interest group or agency.
- (4) The councils shall:
  - (a) hear broad input, including recommendations, biological data, and information regarding the effects of wildlife;
  - (b) gather information from staff, the public, and government agencies; and
  - (c) make recommendations to the Wildlife Board in an advisory capacity.
- (5)
  - (a) Except as required by Subsection (b), each member shall serve a four-year term.
  - (b) Notwithstanding the requirements of Subsection (a), the executive director shall, at the time of appointment or reappointment, adjust the length of terms to ensure that the terms of council members are staggered so that approximately half of the council is appointed every two years.
- (6) When a vacancy occurs in the membership for any reason, the replacement shall be appointed for the unexpired term.
- (7) The councils shall determine:
  - (a) the time and place of meetings; and
  - (b) any other procedural matter not specified in this chapter.
- (8) Members of the councils shall complete an orientation course as provided in Subsection 23-14-2(8).
- (9)
  - (a)
    - (i) Members who are not government employees shall receive no compensation or benefits for their services, but may receive per diem and expenses incurred in the performance of the member's official duties at the rates established by the Division of Finance under Sections 63A-3-106 and 63A-3-107.
    - (ii) Members may decline to receive per diem and expenses for their service.



- b)
  - (i) State government officer and employee members who do not receive salary, per diem, or expenses from their agency for their service may receive per diem and expenses incurred in the performance of their official duties from the council at the rates established by the Division of Finance under Sections 63A-3-106 and 63A-3-107.
  - (ii) State government officer and employee members may decline to receive per diem and expenses for their service.
- (c)
  - (i) Local government members who do not receive salary, per diem, or expenses from the entity that they represent for their service may receive per diem and expenses incurred in the performance of their official duties at the rates established by the Division of Finance under Sections 63A-3-106 and 63A-3-107.
  - (ii) Local government members may decline to receive per diem and expenses for their service.

**History:** C. 1953, 23-14-2.6, enacted by L. 1995, ch. 211, § 6; 1996, ch. 243, § 58; 1997, ch. 276, § 7.

**Administrative Rules.** - This section is implemented by, interpreted by, or cited as authority for the following administrative rule(s): R657-39.

**R657. Natural Resources, Wildlife Resources.**

**R657-39. Regional Advisory Councils.**

**R657-39-1. Purpose and Authority.**

This rule is established under the authority of Sections 23-14-2.6(7) and 23-14-19 to provide the standards and procedures for the operation of regional advisory councils.

**R657-39-2. Definitions.**

- (1) Terms used in this rule are defined in Section 23-13-2.

**R657-39-3. Memberships -- Terms of Office.**

- (1)
  - (a) There are created five regional advisory councils which shall consist of at least 12 members and not more than 15 members each from the wildlife region whose boundaries are established for administrative purposes by the division.
  - (b) Regional advisory councils shall be established as follows:
    - (i) two members who represent agriculture;
    - (ii) two members who represent sportsman;
    - (iii) two members who represent nonconsumptive wildlife;
    - (iv) one member who represents locally elected public officials;
    - (v) one member who represents the U.S. Forest Service;
    - (vi) one member who represents the Bureau of Land Management;
    - (vii) one member who represents Native Americans where appropriate;
    - and
    - (viii) two members of the public at large who represent the interests of the region.
  - (c) The executive director of the Department of Natural Resources, in consultation with the director of the Division of Wildlife Resources, shall appoint

additional members to the councils, up to a total of 15 per region, if deemed necessary to provide adequate representation of local interests and needs.

(d) Members of the councils shall serve a term of four years, except members may be appointed for a term of two years to ensure that the terms of office are staggered.

(e) Members may serve no more than two terms, except:

- (i) members representing Native Americans may serve unlimited terms;
- (ii) members filling a vacancy under Subsection (3) for two years or less will not be credited with having served a term; and
- (iii) members who have served two terms may be eligible to serve an additional two terms after four years absence from regional advisory council membership.

(f) Members' terms expire on July 1 of the final year in the appointed term.

(2) The executive director of the Department of Natural Resources, in consultation with the director of the Division of Wildlife Resources, may remove members of the councils from office for cause, but may not do so without a public hearing if requested by the member.

(3) If a vacancy occurs, the executive director of the Department of Natural Resources, in consultation with the director of the Division of Wildlife Resources, shall appoint a replacement to serve the remainder of the term from a list of nominees submitted by the respective interest group, agency, or the public at large.

(4) (a) Each council shall appoint:

- (i) a chair to conduct meetings and present council recommendations to the Wildlife Board; and
- (ii) a vice chair to conduct meetings in the absence of the chair.

(b) The chair and vice chair shall serve for a two year term of office.

(5) Regional supervisors of the division shall serve as executive secretary to the councils and shall provide administrative support.

(6) Each new member shall attend an orientation course provided by the division to assist them in the performance of the duties of their office.

(7) Any member who fails to attend two consecutive, previously scheduled meetings without contacting the chair shall be considered to have resigned and shall be replaced as provided in this section.

#### **R657-39-4. Meetings.**

(1) Meeting dates and times may be proposed by the Division of Wildlife Resources, but shall be determined by the chair upon at least ten days notice or upon shorter notice in emergency situations.

(2) Meeting locations may be proposed by the Division of Wildlife Resources, but shall be determined by the chair and must be held within the council's regional boundary.

(3) Meetings shall be conducted in accordance with Robert's Rules of Order.

(4) (a) Each council shall provide not less than 24 hours' public notice of the agenda, date, time, and place of each of its meetings.

(b) Public notice is satisfied by:

- (i) posting written notice at the regional division office; and

- (ii) providing notice to at least one newspaper of general circulation within the geographic jurisdiction of the council, or to a local media correspondent.
- (c) When because of unforeseen circumstances it is necessary for a council to consider matters of an emergency or urgent nature, the notice requirements in this section may be disregarded and the best notice practicable given. No such meeting shall be held unless an attempt has been made to notify all of its members and a majority votes in the affirmative to hold the meeting.
- (5) No formal decisions or recommendations may be made at any meeting unless there is a quorum present consisting of a simple majority of the membership of the council.
- (6) Written minutes shall be kept of all council meetings pursuant to Section 52-4-7. Such minutes shall include:
  - (a) the date, time and place of the meeting;
  - (b) the names of members present and absent;
  - (c) the substance of all matters proposed, discussed, or decided, and a record, by individual member, of votes taken;
  - (d) the names of all citizens who appeared and the substance in brief of their testimony;
  - (e) any other information that any member requests be entered into the minutes.
- (7)
  - (a) All council meetings shall be open to the public except that a council may hold a closed meeting as authorized in Utah Code Sections 52-4-4 and 52-4-5.
  - (b) A record of all closed meetings shall be kept and maintained consistent with Utah Code Section 52-4-7.5.

**R657-39-5. Recommendations.**

- (1) Each council shall:
  - (a) hear broad input, including recommendations, biological data, and information regarding the effects of wildlife;
  - (b) gather information from staff, the public, and government agencies; and
  - (c) make recommendations to the Wildlife Board in an advisory capacity.
- (2) The chair of each council or his or her designee shall submit a written recommendation to the Wildlife Board and present its recommendations orally to the Wildlife Board during an open public meeting.
- (3) Councils may not make formal recommendations to the Wildlife Board concerning the internal policies and procedures of the division, personnel matters, or expenditure of the division=s budget.

**KEY: terms of office, public meetings, regional advisory councils\***

**June 3, 2003**

**Notice of Continuation February 15, 2001**

**23-14-2.6(7)**

**23-14-19**

## APPENDIX F . WILDLIFE BOARD

### Utah Code Annotated 1953/TITLE 23 WILDLIFE RESOURCES CODE /CHAPTER 14-2, Wildlife Board

#### Statute text

- (1) There is created a Wildlife Board which shall consist of seven members appointed by the governor with the consent of the Senate.
- (2)
  - (a) The members of the board shall have expertise or experience in at least one of the following areas:
    - (i) wildlife management or biology;
    - (ii) habitat management, including range or aquatic;
    - (iii) business, including knowledge of private land issues; and
    - (iv) economics, including knowledge of recreational wildlife uses.
  - (b) Each of the areas of expertise under Subsection (2)(a) shall be represented by at least one member of the Wildlife Board.
- (3)
  - (a) The governor shall select each board member from a list of nominees submitted by the nominating committee pursuant to Section 23-14-2.5.
  - (b) No more than two members shall be from a single wildlife region described in Subsection 23-14-2.6(1).
  - (c) The governor may request an additional list of at least two nominees from the nominating committee if the initial list of nominees for a given position is unacceptable.
  - (d)
    - (i) If the governor fails to appoint a board member within 60 days after receipt of the initial or additional list, the nominating committee shall make an interim appointment by majority vote.
    - (ii) The interim board member shall serve until the matter is resolved by the committee and the governor or until the board member is replaced pursuant to this chapter.
- (4)
  - (a) Except as required by Subsection (4)(b), as terms of current board members expire, the governor shall appoint each new member or reappointed member to a six-year term.
  - (b) Notwithstanding the requirements of Subsection (4)(a), the governor shall, at the time of appointment or reappointment, adjust the length of terms to ensure that:
    - (i) the terms of board members are staggered so that approximately 1/3 of the board is appointed every two years; and
    - (ii) members serving from the same region have staggered terms.
  - (c) If a vacancy occurs, the nominating committee shall submit two names, as provided in Subsection 23-14-2.5(4), to the governor and the governor shall appoint a replacement for the unexpired term.
  - (d) Board members may serve only one term unless:
    - (i) the member is among the first board members appointed to serve four years or less; or
    - (ii) the member filled a vacancy under Subsection (4)(c) for four years or less.
- (5)
  - (a) The board shall elect a chair and a vice chair from its membership.
  - (b) Four members of the board shall constitute a quorum.
  - (c) The director of the Division of Wildlife Resources shall act as secretary to the board but shall not be a voting member of the board.

- (6) (a) The Wildlife Board shall hold a sufficient number of public meetings each year to expeditiously conduct its business.  
(b) Meetings may be called by the chair upon five days notice or upon shorter notice in emergency situations.  
(c) Meetings may be held at the Salt Lake City office of the Division of Wildlife Resources or elsewhere as determined by the Wildlife Board.
- (7) (a) (i) Members who are not government employees shall receive no compensation or benefits for their services, but may receive per diem and expenses incurred in the performance of the member's official duties at the rates established by the Division of Finance under Sections 63A-3-106 and 63A-3-107.  
(ii) Members may decline to receive per diem and expenses for their service.  
(b) (i) State government officer and employee members who do not receive salary, per diem, or expenses from their agency for their service may receive per diem and expenses incurred in the performance of their official duties from the board at the rates established by the Division of Finance under Sections 63A-3-106 and 63A-3-107.  
(ii) State government officer and employee members may decline to receive per diem and expenses for their service.
- (8) (a) The members of the Wildlife Board shall complete an orientation course to assist them in the performance of the duties of their office.  
(b) The Department of Natural Resources shall provide the course required under Subsection (8)(a).

**History.-** C. 1953, 23-14-2, enacted by L. 1995, ch. 211, § 4; 1996, ch. 243, § 57; 1997, ch. 276, § 6; 2002, ch. 176, § 26.

Annotations

**Repeals and Reenactments.** - Laws 1995, ch. 211, § 4 repeals former § 23-14-2, as last amended by Laws 1983, ch. 320, § 7, creating a Wildlife Board, and enacts the present section, effective May 1, 1995.

**Amendment Notes.** - The 2002 amendment, effective May 6, 2002, inserted "with the consent of the Senate" in Subsection (1) and deleted former Subsection (3)(e) which read: "Each appointment shall be confirmed by the Senate" and made technical corrections.

## **APPENDIX G . WILDLIFE SPECIES OF CONCERN DESIGNATION PROCESS**

### **R657-48. Implementation of the Wildlife Species of Concern and Habitat Designation Advisory Committee**

#### **R657-48-1. Authority and Purpose.**

- (1) Pursuant to Sections 23-14-19 and 63-34-5(2)(a) of the Utah Code, this rule:
- (a) establishes the Wildlife Species of Concern and Habitat Designation Advisory Committee;
  - (b) defines its purpose and relationship to local, state and federal governments, the public, business, and industry functions of the state; and
  - (c) defines the procedure for:
    - (i) the designation of wildlife species of concern as part of a process to preclude listing under the ESA; and
    - (ii) review, identification and analysis of wildlife habitat designation and management recommendations relating to significant land use development projects.

#### **R657-48-2. Definitions.**

- (1) The terms used in this rule are defined in Section 23-13-2.
- (2) In addition:
- (a) "Committee" means the Wildlife Species of Concern and Habitat Designation Advisory Committee.
  - (b) "Conservation species" means wildlife species or subspecies that have been identified as a species of concern and that are currently receiving special management under a conservation agreement developed or implemented by the state to preclude the need for listing under the ESA.
  - (c) "Department" means the Department of Natural Resources.
  - (d) "Division" means the Division of Wildlife Resources within the Department.
  - (e) "ESA" means the federal Endangered Species Act.
  - (f) "Executive Director" means Executive Director of the Department.
  - (g) "Habitat identification material" means maps, data, or documents prepared by the Division in the process of specifying wildlife habitat.
  - (h) "Management recommendations" means determinations of, amount of, level of intensity, timing of, any restrictions, conditions, mitigation, or allowances for activities proposed for a project area pursuant to this rule.
  - (i) "NEPA" means the National Environmental Policy Act as defined in 42 U.S.C. Section 4321-4347.
  - (j) "Interested Person" means an individual, firm, association, corporation, limited liability company, partnership, commercial or trade entity, any agency of the United States Government, the State of Utah, its departments, agencies and political subdivisions.
  - (k) "Project area" means the geographical area covered by a significant land use development.

- (l) "Proposed wildlife habitat designation" means identified habitat in a project area undergoing review pursuant to this rule.
- (m) "RDCC" means the Resource Development Coordinating Committee as provided in Section 63-28a-1.
- (n) "Significant land use development" means an RDCC review item identified as such by the State Planning Coordinator, any projects or developments identified by the Executive Director, or as approved through petition as described in Section R657-48-5.
- (o) "Wildlife habitat designation document" means the decision of the RDCC after following the provisions of this rule for wildlife habitat designation and management recommendations for a project area.
- (p) "State sensitive species" means:
  - (i) species listed under the ESA now or previously present in Utah;
  - (ii) candidate species under the ESA now or previously present in Utah;
  - (iii) a state conservation species; or
  - (iv) a state wildlife species of concern.
- (q) "Wildlife habitat designation" means the wildlife habitat identification within a project area issued pursuant to this rule.
- (r) "Wildlife habitat identification" means the description, classification and assignment by the Division of any area of land or bodies of water as the habitat, range or area of use, seasonally, historically, currently, or prospectively of or by any species of game or non-game wildlife in the State of Utah.
- (s) "Wildlife species of concern" means a wildlife group within the state of Utah for which there is credible scientific evidence to substantiate a threat to continued population viability.

**R657-48-3. Department Responsibilities.**

- (1) There is established a Wildlife Species of Concern and Habitat Designation Advisory Committee within the Department of Natural Resources.
- (2) The Department shall provide staff support, arrange meetings, keep minutes, and prepare and distribute final recommendations.

**R657-48-4. Committee Membership and Procedure.**

- (1) Committee membership shall consist of:
  - (a) the Executive Director of the Department;
  - (b) the Director of the Division or a designee;
  - (c) the Director of the Division of Oil, Gas and Mining or a designee;
  - (d) the Director of the Division of Water Resources or a designee; and
  - (e) any other Department Division heads or designees as determined by the Executive Director of the Department.
- (2) The Executive Director shall serve as chair.
- (3) Three members, consisting of the Executive Director, the Director of the Division of Wildlife Resources and the Director of the Division of Oil, Gas & Mining, shall constitute a quorum for meetings of the Committee.
- (4) The Committee shall meet as specified by the Executive Director.

(5) The following procedure shall be used for submitting review items to the Executive Director for inclusion on the Committee agenda:

- (a) the Division Director shall submit for committee review all proposed designations or re-designations of each wildlife species of concern; and
- (b) the Division Director shall submit for committee review any proposed or existing wildlife habitat designation and corresponding management recommendations within a project area.
  - (i) The Division shall support its proposals for wildlife species of concern designations, wildlife habitat designation and management recommendations with:
    - (A) studies, investigations and research supporting the need for the designation and the potential impacts of each proposal;
    - (B) field survey and observation data; and
    - (C) federal, state, local and academic information on habitat, historical distribution, and other data or information collected in accordance with generally accepted scientific techniques and practices.

(6) Species at the edge of their range or with limited distribution may be included for evaluation.

(7) The Department will provide an analysis of potential impacts of the proposed designations and the existing social and economic needs of the affected communities and interests.

**R657-48-5. Public Participation and Setting of Meeting Agenda.**

(1) An interested person may petition the Executive Director for a hearing before the Committee to designate a project as a significant land use development for purposes of this rule.

(2) The Executive Director shall act to approve or disapprove a petition or extension request within 14 days.

(3) (a) The agenda shall consist of items determined by the Executive Director, and copies shall be sent to Committee members and other interested persons as requested.

(b) Requests to receive notices and agendas must be submitted in writing to the Executive Director's Office as provided in Subsection R657-48-9(1).

(4) Any interested person may:

- (a) submit comments on proposed species of concern and wildlife habitat designations;
  - (i) submissions must be submitted in writing to the Executive Director for review and must be submitted at least seven days prior to the meeting;
- (b) request an extension of up to 30 days to review a proposed Committee action; or
- (c) request to make an oral presentation before the Committee.
  - (i) An interested person seeking to make a presentation before the Committee concerning any matter under review, must submit a written request and supporting documentation to the Executive Director at least 14 days prior to the meeting.



**R657-48-6. Committee Review Actions.**

- (1) In conducting a review of issues, the Committee may:
  - (a) require additional information from the Division, the Department or interested persons;
  - (b) require the Division or interested persons to make presentations before the Committee or provide additional documentation in support or opposition of the recommendation;
  - (c) schedule additional meetings where public interest or agency concern merits additional discussion;
  - (d) undertake additional review functions as needed; or
  - (e) consider the need for involvement of other persons or agencies, or whether other action may be needed.
- (2) Following the Committee's review and recommendation, the Executive Director shall:
  - (a) make a final determination and recommend the approval of proposed wildlife species of concern designations to the Wildlife Board; or
  - (b) in the case of proposed wildlife habitat designation, recommend wildlife habitat designations and proposed management recommendations to the RDCC.
- (3) The Executive Director's decision will be announced at that meeting, or the next formal meeting, on the proposed species of concern or habitat designation, unless an alternative time is required by federal or state law, or rule.

**R657-48-7. Wildlife Species of Concern Designation Process.**

- (1) A wildlife species of concern designation shall be made only after the Executive Director, following consideration of the Committee's recommendations, has made a formal written recommendation to the Wildlife Board, and after that Board has considered:
  - (a) the Executive Director's recommendation, and all comments on such recommendation; and
  - (b) all data, testimony and other documentation presented to the Committee and the Wildlife Board pertaining to such proposed designation.
- (2) All wildlife species of concern designations shall be made:
  - (a) pursuant to the procedures specified in this rule; and
  - (b) as an independent public rulemaking pursuant to the Administrative Rulemaking Act, Title 63, Chapter 46(a) of the Utah Code.
- (3) With the proposed rule and any amendments for a wildlife species of concern, the accompanying analysis shall include either a species status or habitat assessment statement, a statement of the habitat needs and threats for the species, the anticipated costs and savings to land owners, businesses, and affected counties, and the inclusion of the rationale for the proposed designation.
- (4) The Wildlife Board may approve, deny or remand the proposed wildlife species of concern designation to the Executive Director.
- (5) Until a rule designating a wildlife species of concern is finalized, the proposed rule may not be used or relied upon by any governmental agency, interested person, or entity as an official or unofficial statement of the state of Utah.

(6) The Division shall maintain all data collected and other information relied upon in developing proposed species of concern designations as part of the administrative record and make such information available, subject to the Government Records Access and Management Act as defined in Section 62-2-101, for public review and copying upon request.

**R657-48-8. Wildlife Habitat Designations and Management Recommendations.**

(1) Wildlife habitat designations and management recommendations for project areas will be made pursuant to the procedures specified by this rule.

(2) Any Department or Division map, identification of habitat, document or other material that is provided or released to, or used by any persons, including federal agencies, which includes wildlife habitat designations that have been adopted under this rule will so indicate.

(3) A proposed wildlife habitat designation and management recommendation shall be adopted by RDCC only after the Executive Director, following consideration of the Committee's recommendations, has made a formal written recommendation to RDCC and the RDCC has considered:

(a) the Executive Director's recommendation and all comments on such recommendation; and

(b) all data, testimony and other documentation presented to the Committee pertaining to such proposed designation.

(4) RDCC shall act on the proposal pursuant to its rules.

(5) If rejected or remanded for modification to the Executive Director by RDCC, the Executive Director may make the recommended modifications, conduct a further review of the proposed wildlife habitat designation, or withdraw the proposed wildlife habitat designation from further consideration.

(6) Until a final determination on a proposed wildlife habitat and management recommendation has been made by the Executive Director and adopted by RDCC, the proposed wildlife habitat or management recommendations may not be used or relied upon by any other governmental agency, interested person, or entity as an official or unofficial statement of the state of Utah.

(7) A Wildlife Habitat Designation document developed for the purpose of this rule, having completed the RDCC process, shall be attached to the wildlife habitat identification materials and made available for public review or copying upon request.

(8) The Division shall maintain all data collected and other information relied upon in developing proposed wildlife habitat designations and management recommendations as part of the administrative record, and make this information available in accordance with the Government Records Access and Management Act as defined in Section 62-2-101, for public review and copying upon request.

**R657-48-9. Distribution.**

(1) The Division shall send by mail or electronic means a copy of a proposed species of concern designation or wildlife habitat and management determination established under this rule to the following:

- (a) any person who has requested in writing that the division provide notice of any proposed species of concern designations or proposed wildlife habitat and management recommendations under this rule; and
  - (b) county commissions and tribal governments, which have jurisdiction over lands that are covered by a proposed wildlife habitat designation and management recommendation and of lands inhabited by a species proposed to be designated as a species of concern under this rule.
- (2) Species of concern designations, wildlife habitat designations or management recommendations may not be used by governmental entities as a basis to involuntarily restrict the private property rights of landowners and their lessees or permittees.

**KEY: species of concern\*, habitat designation\***  
**June 13, 2001**

**23-14-19**  
**63-34-5(2)(a)**

## **APPENDIX H . PROGRAMS FOR PUBLIC EDUCATION AND INVOLVEMENT**

*Adopt-a-Waterbody.*— Adopt-A-Waterbody (AAW) is a community involvement program designed to benefit both Utah's water resources the volunteer groups involved. A partnership of three state agencies directs the program. In 2004, 67 new locations were added to the Adopt-a-Waterbody program. One or more groups have worked at each site to improve lakes and streams throughout Utah. An element of the program, watershed education, reached approximately 23,000 people through such venues as the Sportsman's Expo, Great Salt Lake Bird Festival, etc. Hatchery tours were provided to over 7,000 people during the summer months.

*Aquatic Education.*— This program focuses on resource stewardship and angler recruitment and retention, and provides watershed and aquatic and terrestrial species education to youth and adults. UDWR staff have worked with 56 schools to present formal classroom watershed and aquatic education to over 6,000 students in grades 4 through 9. Additionally, information has been provided in informal settings, such as the Utah State Fair, International Sportsman's Expo, Utah Boating and Fishing Expo, Great Salt Lake Bird Festival, Davis County Fair, Utah Boy Scouts Scout-a-rama, Utah Envirothon, Utah State Parks and Utah State University (USU). Educational lessons and presentations are aligned to Utah State Education Core Curriculum requirements as prescribed by the Utah State Office of Education. Organized stewardship projects including trash cleanup, planting vegetation, removing invasive plant species, stabilizing stream banks and monitoring water quality (all of which may benefit both aquatic and terrestrial sensitive species). As we recruit new anglers and get them involved in a lifetime recreational skill, stewardship and ethics are a large part of the information imparted to them.

Educating the non-angling public on stewardship issues and having them become advocates for the conservation of wildlife and habitats, particularly those of greatest conservation need, are also priorities. DWR's public outreach programs that stress the protection of wildlife habitat and watersheds, including sensitive species and their habitats, are critical for sustainable quality of human life, outdoor recreation activities and for people to have a quality outdoor experience.

The program has the support of many retail stores, such as Sportsmen's Warehouse, as well as several wholesalers. Retailers that provide DWR with discounted materials as well as an abundance of donated items include Fish Tech Outfitters, Hooked, Berkley, Pure Fishing, Eagle Claw, and Stutsman Rods. We collaboratively share responsibilities in numerous outreach and education efforts, which affect the conservation behaviors of citizens, especially youth, thus potentially indirectly benefiting sensitive species and their habitats. The Future Fisherman Foundation, also a partner, and does several "Hooked on Fishing, Not on Drugs" workshops throughout the year.

*Bald Eagle Day.*—This day is set aside annually on the first Saturday in February to provide public citizens the opportunity to learn about the national bird and to see the species in its natural settings. Attendees learn about Bald Eagle natural history and ecology, the importance of preserving this magnificent bird, and preserving bald eagle habitats in their local area. This activity is well received and well attended.

*Blue Ribbon Fisheries.*—Direct and indirect relevance to sensitive species and associated habitat conservation. An Advisory Council advises DWR on direct restoration, conservation, and protection of aquatic systems (i.e., waters and watersheds) that may support sensitive species. The council is comprised of representatives from various angling organizations. However, members are not nominated to any categorical representative position, but are currently appointed by the Governor and do represent regional interests.

Annually, make recommendations to spending up to the Division Director of approximately \$500,000 to enhance and restore aquatic habitat, protect sensitive species such as native cutthroat trout, and develop public awareness, access, and understanding of these valuable natural resources. Funding comes from a portion of the revenue received from the sale of fishing licenses. This benefits the DWR in license sales and other economic benefits to Utah, especially in rural areas of the state. Ten such projects are currently underway in FY 05, seven of which involve sensitive aquatic species/habitat.

*Brian Head Field Ecology.*—Direct and indirect relevance to sensitive species and associated habitat conservation. This is a 5-day field ecology and training course for secondary level educators conducted by Southern Utah University, Dixie National Forest and the Division. Educators conduct field studies in spruce/fir forests near Cedar Breaks NM to monitor ecological trends in forests suffering from insect infestation. Topics of investigation include trends in small mammal, forest bird and insect populations, evidence of human impacts, and measurement of vegetative changes. Participating teachers design and conduct their own experiment. They then use the skills they learn during this course to establish lesson plans for their own science class projects. Participants can receive certification and/or college credit for this course. Results are used by management agencies to develop management strategies and compiled in an annual report. Future professional publications are anticipated.

*Community Fisheries.*—This program provides a service by offering a local recreation destination site to individuals within communities. In 2004, 1,700 youth took part in an 8-week youth fishing program, enabling youth, their siblings and parents opportunities to interact, associate, and learn from the DWR staff on an informal basis for two hours a week. The program trains and uses volunteers from the local communities to mentor the youth in the youth fishing program. Last year there were 250 active volunteers who provided over 2,700 hours or roughly \$52,000 in donated time. These volunteers were recruited from church groups, eagle scouts, schools, and local fishing clubs. The donated volunteer time donated acts as a match to moneys from USFWS grants. Volunteers planted trees, shrubs, sedges, rushes, and grasses to help provide habitat for the wildlife and fish in the project areas, thus achieving management goals and reclamation of previously undesirable land that may in turn support sensitive species. This volunteerism is critical for not only the immediate ecological benefit, but for the longer term “buy-in” that will guarantee support for managing fish and wildlife of greatest conservation need.

The interaction between families and the Utah Division of Wildlife Resources (DWR) will only increase support for other DWR programs, such as sensitive species conservation in the future. Exposure to ecological concepts may encourage greater

support for the protection/restoration of sensitive species and their associated habitats. Benefits the DWR from the increased fishing license sales that the local fisheries provide, as well as the future license sales to the youth that are involved in the youth fishing programs in the community fisheries.

Several fishing organizations have assisted in the development of these fisheries and their sustainability is supported by these groups. They have helped transplant fish into new or struggling community waters to restore the ecological balance of the fisheries, some of which support a variety of terrestrial and/or aquatic sensitive species. These groups also donate fishing rods, hooks, jigs, and money for habitat restoration. These groups include: Trout Unlimited, Sportsmen for Fish and Wildlife, Rocky Mountain Anglers, Utah Bass Federation, Hi Country Bass Masters, Strawberry Anglers, Stone Fly Society, 4-H, as well as other local sportsmen groups. Sportsmen for Fish and Wildlife, Trout Unlimited, 4-H, and Hi Country Bass Masters adopted five youth fishing clubs for which they take full responsibility.

The program has the support of many retail stores, such as Sportsmen's Warehouse, as well as several wholesalers. Retailers include Fish Tech Outfitters, Hooked, Berkley, Pure Fishing, Eagle Claw, and Stutsman Rods. These stores provide DWR with discounted materials as well as donated items. DWR works directly with the Utah Botanical Center and Utah State University as active partners. We collaboratively share responsibilities in numerous outreach and education efforts, which affect the conservation behaviors of citizens, especially youth, thus potentially indirectly benefiting sensitive species and their habitats. Retail sales partners share DWR concerns about angler recruitment. The youth are our future license buyers and conservationists and without them, aquatic systems and sportfish programs both have no future. The DWR Habitat Council allocated over \$500,000 dollars towards projects including planting trees, shrubs, rushes and sedges to improve the habitat in over 75 acres of wetlands/ponds which may foster greater involvement in the restoration, protection and conservation of aquatic systems that support sensitive species.

*Dedicated Hunters (DH) & Volunteers.*—The DH program began in 1995 and in exchange for additional hunting opportunities, participants provide at least 24 hours of service as a volunteer on Wildlife Conservation Projects. In fiscal year 2004 volunteers provided just over 89 thousand hours of service for the division, equating to nearly 43 full-time employees. Due to these volunteer efforts, the division was able to claim \$187,252.28 in Federal Aid. Participants in the Dedicated Hunter program accounted for 70 percent of the volunteer effort in fiscal year 2004. The division uses specially trained volunteers to provide informational field trips and hands-on education programs at Hardware Ranch, Farmington Bay Waterfowl Management Area and the states fish hatcheries.

The division is also working on a Master Naturalist certification program that will enhance people's love of nature with a research-based, scientific training program coupled with community-based volunteer service. Master Naturalist volunteers will provide the DWR and community with volunteer service in the form of educational activities, public relations, and so forth.

*Migratory Bird Day.*—This is an annual observation and celebration of the importance of migratory bird species to the environment and their role/position in Utah. Conducted by the UDWR in association with numerous groups, including USFS, BLM

and The Audubon Society. Goals of this event are to 1) inform the public of the great diversity of birds in North America and Utah, 2) explain the important role these birds play in our environment, 3) train the public in bird identification, 4) educate the public about the natural history of birds, 5) educate the public about ways they can help birds in their own communities, 6) offer tips on landscaping yards for birds (and often providing suitable plants with which to begin landscaping projects).

*Project WILD.*—This program focuses on training teachers and other youth educators to inform and educate students and young citizens throughout the state. Our trained educators use Project WILD Activity Guides, which include several activities that address threatened and endangered species. Project WILD also maintains a library of wildlife education resource trunks, that include information and materials about various sensitive, threatened and endangered species, which trained educators can borrow.

Conservation education activities that help youth learn about wildlife and its conservation are modeled by qualified, trained Project WILD facilitators. Since 1983 in Utah, more than 11,000 Project WILD educators have been trained, and each educator reaches an average of 80 students per year. In 2003-04, all trunks were used more than 230 times, reaching 17,876 children. DWR personnel frequently use Project WILD materials and activities when they make presentations throughout the state. During 2004, more than 45,000 students and other youth benefited from such programs, conservation fairs and sporting shows, etc.

In 2004, the Project WILD program completed a new Utah Wildlife Photo Series Packet which includes a set of sixteen 8 ½" x 11" cardstock picture cards. Information on the reverse side of each picture card tells about the particular species depicted on the front. Written text includes classification of the species, including those of greatest conservation need, notable features, habitat/habits, and management and conservation information, plus a range map. Via a grant from the State of Utah's Department of Natural Resources' Endangered Species Mitigation Fund, cards for six Utah species of special concern were included in this new photo packet. The Outdoor Resources Foundation provided some funding for the printing of the remaining 10 photo cards. Over 1,000 schools throughout the state received a new wildlife photo packet in 2004. In an effort to establish a revolving fund project, the balance of packets are available to interested persons for a small donation intended to help produce future wildlife photo packets for free school distribution.

*Strawberry Valley Wildlife Festival.*—The festival celebrates the diversity and abundance of wildlife in the valley to increase awareness and appreciation for species of conservation need. Conservation organizations provide festival booths and displays that promote a common vision of watershed health and balanced resource uses in Strawberry Valley. Formal presentations by sensitive species experts focus on improving habitat for sensitive species. Festival sponsors include DWR (Central Region lead), USFS, Wasatch County, City of Heber, Friends of Strawberry Valley, Strawberry Anglers Association and others.

*Columbia Spotted Frog Reintroduction At Swaner Nature Preserve.*—The reintroduction project is the first on-the-ground activity ever conducted in the United States to expand the range of the Columbia spotted frog. Between 4,000 and 5,000 spotted frog tadpoles were released in May, 2004 and will be monitored throughout the future. Outreach efforts include in-depth strategies to publicize the project and educate

both the local public, potentially achieving national awareness. Benefits of the publicity campaign have provided awareness, appreciation and stewardship for this sensitive species. Note: Shortly after the event, a new bookstore was seen in Park City called “The Spotted Frog Bookstore”, thus indicating a great level of success with this outreach campaign. All Park City school children have been made aware of the project as well. Partners include DWR (Central Region lead), Brigham Young University, Swaner Nature Preserve (in Park City), Natural Resource Conservation Service, landowners, and local governments.

*Sensitive Species Education Campaigns for Schools Students & Scouts.*—Thousands of school children and scouts in the Central Region are educated annually by UDWR personnel regarding Utah’s sensitive species, increasing their awareness, appreciation, and stewardship. Scout requirements for their “bear” advancement and at least one other merit badge require doing research, sometimes directly with UDWR personnel, on sensitive/extinct species.



## **APPENDIX I . LANDOWNER INCENTIVE PROGRAM IN UTAH**

### **1.0 OVERVIEW**

The Utah Habitat Conservation Initiative will bring together state and federal financial resources, along with technical assistance from the Division of Wildlife Resources (Division), partnering agencies and conservation organizations, and participating landowners to implement a habitat conservation program that benefits threatened, endangered, and at-risk species on private lands.

### **2.0 BACKGROUND AND NEED**

#### **2.1 Habitats and associated species-at-risk in Utah**

Habitat conversion, habitat fragmentation, and land and water use practices are significant contributing factors to the decline of wildlife species in Utah. To track the changing status of wildlife species in Utah, the Division has prepared a publication, the Utah Sensitive Species List, which includes ESA-listed species (endangered, threatened, or candidate species), conservation agreement species, and "species of concern" that were identified by accessing the Heritage Program resources through the Utah Conservation Data Center and augmenting it with other data sources such as the Partners In Flight — Utah Avian Conservation Strategy. The Division is in the process of drafting its Comprehensive Wildlife Conservation Strategy (CWCS) to remain eligible for State Wildlife Grants. The Utah Sensitive Species List will serve as the basis for the CWCS, which will establish the foundation for all conservation actions needed to protect sensitive species, grouped into three tiers as follows: Tier I — federally designated species, Tier II — state designated species (State Species of Concern), and Tier III — state species of conservation need:

**Tier I species:** federally designated species, including endangered, threatened, candidate, and proposed species, as well as "Conservation Species" covered through a multiparty conservation agreement.

**Tier II species:** state designated "Species of Concern" including all those species that are so selected through the Utah Wildlife Species of Concern and Habitat Designation Advisory Committee and approved by the Utah Wildlife Board.

**Tier III species:** state designated species that are one or more of the following – a specie for which there are insufficient data to establish population status, a species that serves as an indicator of habitat in jeopardy, a species that has had a substantive decline in populations, or a species that warrants specific conservation attention due to risks/threats present.

Although a variety of habitats are critical to the survival of these species, the Division has identified two main focus areas for its Habitat Conservation Initiative. The areas include

lands that are privately owned, provide important habitats for a variety of Tier I, II & III species, and are expected to rank high among the conservation priority areas yet to be identified in Utah's CWCS. The focus areas include:

1. Sagebrush steppe uplands supporting populations of Greater Sage-grouse (*Centrocercus urophasianus*), Gunnison Sage-grouse (*Centrocercus minimus*), Columbian Sharp-tailed Grouse (*Tympanuchus phasianellus columbianus*), other at-risk neotropical migratory bird species, pygmy rabbit (*Brachylagus idahoensis*), Utah prairie-dog (*Cynomys parvidens*), white-tailed prairie-dog (*Cynomys leucurus*), or Gunnison's prairie-dog (*Cynomys gunnisoni*); and
2. Low-to-mid elevation riparian corridors and associated wetlands supporting Columbia spotted frog (*Rana luteiventris*), least chub (*Notichthys phlegethontis*), Bonneville cutthroat trout (*Oncorhynchus clarki utah*), Colorado River cutthroat trout (*Oncorhynchus clarki pleuriticus*), native populations of Yellowstone cutthroat trout (*Oncorhynchus clarki bouvieri*), Yellow-billed Cuckoo (*Coccyzus americanus*), Southwestern Willow Flycatcher (*Empidonax traillii extimus*), or other at-risk neotropical migratory bird species.

Conservation activities on private lands in these two focus areas are expected to benefit at least 69 of the 196 species on the CWCS species list, or 35% of the total.

### **2.1 a. Sagebrush steppe habitat**

Conversion of sagebrush to agricultural cropland, herbicide treatments, overgrazing by livestock and big game, and fire suppression have significantly altered the distribution of sagebrush communities and habitat conditions statewide. The Division, in cooperation with the Utah State Department of Agriculture and Food, Bureau of Land Management, and U. S. Forest Service maintains a range trend monitoring program that documents vegetation composition changes on over 750 permanent study sites on private and public land statewide. The program was initiated in 1981, and over the last 15 years, significant changes have been observed in low-mid elevation (4,500–6,500 ft.) sagebrush communities. Sites are characterized by dense stands of old, decadent shrubs, significant amounts of bare ground, few native grasses and forbs, and an understory that has become dominated by cheatgrass and other invasive weeds. In the fifth year of a significant drought, sagebrush stands in eastern Utah are experiencing significant mortality on a landscape scale. In August 2003, an interagency assessment team identified sagebrush mortality on approximately 600,000 acres in the Uinta Basin and southeastern Utah.

### **2.1 b. Riparian Habitat**

In the West, riparian habitat covers less than 1% of the land, yet the role of riparian habitat in the landscape is substantial. Within Utah, 66–75% of all bird species use riparian habitats during some portion of their life history. Typically, diversity and abundance of birds dramatically increases in western riparian habitat compared with other habitat types, and numerous avian species are now considered as riparian obligates.

Few low-mid elevation streams in Utah can be classified as fully-functional waterways. Most are restricted in their natural migration across former floodplains by transportation corridors involving roads, railways or both. Shortened streams lack the ability to absorb the energy of high flows, and suffer from downcutting and excessive bank erosion. Early attempts at "flood control" used heavy equipment to sever the connection between stream channels and floodplains, eliminating the opportunity for natural maintenance of riparian zones with periodic flood events. Some streams are impacted by watersheds that fail to trap, store and slowly release water as groundwater, but release it as runoff that causes erosion in upland areas, causing additional sediment transport in streams and excessive stream bank erosion. Some of these watersheds have been placed on the State's Section 303(d) (Clean Water Act) list of impaired watersheds, making them eligible for federal funding. All of the water in streams has been fully appropriated by the State for a variety of beneficial uses, and diversions regularly dewater some streams, and significantly reduce flows in others. Unless properly managed, livestock concentrate in riparian areas, overgraze vegetation and impact water quality. Wetlands associated with riparian areas are impacted by permitted fill or drainage projects, and water quality in rural areas can be affected by agricultural practices such as grazing and chemical treatments (herbicide and fertilizer applications).

### **3.0 OBJECTIVES**

The overall objective is to implement a program to provide technical and financial assistance to landowners to protect habitat for at-risk species on private lands located in focus areas throughout the state with \$2,480,000 in initial funding through Utah's Habitat Conservation Initiative. This will be accomplished by providing funding for at least 15 projects with private landowners by May 31, 2004 as detailed below.

#### **3.1 Sagebrush steppe habitat**

- Finalize agreements to protect and restore 3,500 acres of sagebrush steppe habitat in Box Elder, Cache and Rich counties and implement habitat restoration projects associated with these agreements by November 30, 2004 to benefit Greater Sage-grouse and/or Columbian Sharp-tailed grouse.  
&nbsp;
- Finalize agreements to protect and restore an additional 3,500 acres of sagebrush steppe habitat statewide by June 30, 2004 and implement habitat restoration projects associated with these agreements by November 30, 2004 to benefit Greater Sage-grouse.  
&nbsp;
- Finalize agreements to protect and manage 1,500 acres of sagebrush steppe habitat in San Juan County by April 30, 2005 to benefit Gunnison Sage-grouse.  
&nbsp;
- Conduct pre and post-treatment surveys in project areas to evaluate impacts to sensitive species.

### **3.2 Riparian habitat**

- Finalize agreements to protect 175 acres of riparian/wetland habitat by April 30, 2005 to benefit Columbia spotted frog and/or Least chub.
- Finalize agreements to protect and restore 2.75 miles of low-mid elevation riparian corridors (50 acres total, average width of 100 feet) that provide habitat for native cutthroat trout or breeding habitat for Southwestern Willow Flycatcher, Yellow-billed Cuckoo or other neotropical migratory bird species on the Utah State Sensitive Species List by April 30, 2005, and implement habitat restoration projects associated with these agreements by November 30, 2005.
- Conduct pre and post-treatment surveys in project areas to evaluate impacts to sensitive species.

### **3.3 Sagebrush steppe habitat conservation activities**

Conservation activities in this focus area will be guided by specific actions identified in the Utah Strategic Management Plan for Sage Grouse (and subsequent sage grouse conservation plans prepared by local working groups), the Utah Avian Conservation Strategy (Partners In Flight), and the Coordinated Implementation Plan for Bird Conservation in Utah (Intermountain West Joint Venture - Utah State Steering Committee) described above in

#### Background and Need

**3.3 a. Greater Sage Grouse, Columbian Sharp-tailed Grouse, and Gunnison Sage Grouse**  
Habitat restoration, accompanied by management agreements, based on sound resource conservation plans, will be the standard approach used for conserving Greater Sage-grouse habitat on private land. Resource conservation plans will be prepared with each landowner that protect and restore wildlife habitat while maintaining economically viable ranching operations. The Division will elicit the assistance of the USDA Natural Resources Conservation Service, Utah Association of Conservation Districts, and local non-profit organizations such as the Utah Grazingland Network and Association for Quality Resource Management to work with landowners to develop and implement sustainable grazing systems as part of the plan. Conservation easements, in conjunction with habitat restoration, will be important tools for protecting and restoring important Gunnison Sage-grouse habitat within the core conservation area identified in San Juan County.

#### **3.3 b. Other Sensitive Species**

Division biologists will participate in planning habitat restoration projects that benefit other at-risk species in the focus areas, such as pygmy rabbit, sage thrasher, sage sparrow and Brewer's sparrow. Pre and post-treatment surveys will be conducted in project areas to evaluate impacts to sensitive species.

### **3.4 Riparian habitat conservation activities**

For "conservation agreement" species, riparian/wetland habitat conservation activities will be guided by goals and objectives identified in the conservation agreement and strategy documents for Columbia spotted frog, least chub, Bonneville cutthroat trout, and Colorado River cutthroat trout. Riparian conservation efforts on behalf of the other priority species will be guided by the Utah Division of Wildlife Resources Strategic Plan: 1998–2003, the Partners In Flight Utah Avian Conservation Strategy, the Coordinated Implementation Plan for Bird Conservation in Utah, prepared by the Intermountain West Joint Venture State Committee (draft only), and when completed, the Division's Comprehensive Wildlife Conservation Strategy.

#### **3.4 a. Columbia Spotted Frog**

The "Conservation Agreement and Strategy for Columbia Spotted Frog" identifies the threats to existing populations in Utah and conservation objectives for the species. Spotted frog populations in Utah have been separated into three geographic management units (Wasatch Front, Sevier River, and West Desert), and technical teams have prepared habitat management plans that describe detailed strategies for protecting occupied habitats within each management unit. Proposed actions include securing perpetual conservation easements, modifying habitats (vegetation enhancement, securing water levels, dredging spring heads to create open water to increase breeding and larval habitat), restricting grazing during the breeding season and monitoring effectiveness of habitat renovations.

#### **3.4 b. Least Chub**

The "Conservation Agreement and Strategy for Least Chub" (Revised April 2003) identifies bank stabilization, riparian/spring fencing, sustainable grazing practices, maintaining and restoring natural hydrologic characteristics and water quality where possible, protecting habitats with conservation easements or other regulatory mechanisms (e.g., memorandums of understanding) and monitoring effectiveness of habitat conservation actions as high priority conservation measures.

#### **3.4 c. Native Cutthroat Trout (Bonneville, Colorado River, Yellowstone), Southwestern Willow Flycatcher, Yellow-billed Cuckoo, and Other Sensitive Neotropical Migratory Bird Species**

The Division will secure needed stream flows, water storage, and deed-associated protection for wildlife habitat in priority riparian areas through the acquisition of easements (perpetual and term) and leases. Division aquatic biologists with training in fluvial geomorphology will work with landowners to plan and implement stream restoration projects that reestablish functional floodplains, and increase species and structural diversity in broadened riparian zones. Migration barriers will be installed where necessary to isolate native trout from non-native species. Fencing may be required to isolate streams from adjacent pastures.

## APPENDIX J . MONITORING METHODS FOR TIER I, II, AND III SPECIES IN UTAH

<b>Amphibian Species</b>	<b>CWCS Tier</b>	<b>Population Monitoring Methods</b>
Arizona toad	II	Direct observation, call monitoring
Canyon treefrog	III	Direct observation, call monitoring
Columbia spotted frog	I	Egg mass counts; mark/recapture population estimates
Great plains toad	III	Direct observation, call monitoring
Mexican spadefoot	III	Direct observation, call monitoring
Northern leopard frog	III	Direct observation, call monitoring
Pacific treefrog	III	Direct observation, call monitoring
Plains spadefoot	III	Direct observation, call monitoring
Relict leopard frog	I	extirpated
Western toad	II	Direct observation, call monitoring; egg mass counts; mark/recapture population estimates

<b>Bird Species</b>	<b>CWCS Tier</b>	<b>Population Monitoring Methods</b>
American Avocet	III	GSL Waterbird Surveys
American White Pelican	II	GSL Waterbird Surveys, Nest site surveys
Bald Eagle	I	Nest site surveys, Midwinter surveys
Band-tailed Pigeon	III	Nest site surveys, BBS
Bell's Vireo	III	Riparian point transect surveys, Mist net
Bendire's Thrasher	III	Tape-playback, BBS
Black Rosy-finch	III	Alpine Line Transect surveys
Black Swift	II	Nest site surveys
Black-billed Cuckoo	III	Tape-playback
Black-necked Stilt	III	GSL Waterbird Surveys
Black-throated Gray Warbler	III	Pinyon-juniper point count surveys, BBS, Mist Net
Bobolink	II	Tape-playback

Boreal Owl	III	Tape-playback
Brewer's Sparrow	III	Shrubsteppe Line Transect surveys, BBS, Mist Net, Spot Map
Broad-tailed Hummingbird	III	Riparian point transect surveys, BBS, Mist net
Burrowing Owl	II	Tape-playback, Nest site surveys, BBS
California Condor	I	Respond to reports, Nest site surveys
Caspian Tern	III	GSL Waterbird Surveys
Crissal Thrasher	III	Tape-playback, BBS
Ferruginous Hawk	II	Nest site surveys, Aerial surveys
Gambel's Quail	III	BBS
Grasshopper Sparrow	II	Tape-playback, Line Transect surveys, Breeding Bird Survey point counts (BBS)
<del>Gray Flycatcher</del>	<del>III</del>	<del>BBS, Tape-playback</del>
Gray Vireo	III	Pinyon-juniper point count surveys, BBS, Mist Net
Greater Sage-grouse	II	Lek Counts, Brood Counts
Gunnison Sage-grouse	I	Lek Counts, Brood Counts
Lewis's Woodpecker	II	Tape-playback
Long-billed Curlew	II	Great Salt Lake (GSL) Waterbird surveys
Lucy's Warbler	III	Riparian point transect surveys, BBS, Mist Net
Mexican Spotted Owl	I	Tape-playback, Nest site surveys
Mountain Plover	III	GSL Waterbird Surveys
Northern Goshawk	I	Tape-playback
Osprey	III	Nest site surveys
Peregrine Falcon	III	Nest site surveys
Sage Sparrow	III	Shrubsteppe Line Transect surveys, BBS, Spot Map
Sage Thrasher	III	Shrubsteppe Line Transect surveys, BBS, Spot map
Sharp-tailed Grouse	II	Lek Counts, Brood Counts
Short-eared Owl	II	Nest site surveys, BBS
Snowy Plover	III	GSL Waterbird Surveys
Southwestern Willow Flycatcher	I	Tape-playback
Three-toed Woodpecker	II	Tape-playback
Virginia's Warbler	III	Riparian point transect surveys, BBS

Whooping Crane - extirpated	I	Respond to reported observations
Williamson's Sapsucker	III	Tape-playback
Yellow-billed Cuckoo	I	Tape-playback

<b>Fish Species</b>	<b>CWCS Tier</b>	<b>Population Monitoring Methods (CPUE = Catch per Unit Effort)</b>
Bear Lake sculpin	II	Trawls/CPUE
Bear Lake whitefish	II	Gill nets/CPUE
Bluehead sucker	I	Electroshocking/depletion population estimates, mark/recapture population estimates; seines
Bonneville cisco	II	Hydroacoustics/population estimates
Bonneville cutthroat trout	I	Spawning traps, electroshocking/depletion population estimates
Bonneville whitefish	II	Gill nets/CPUE
Bonytail	I	Trammel nets; mark/recapture population estimates
Colorado pikeminnow	I	Electroshocking; mark/recapture population estimates/CPUE; seines
Colorado River cutthroat trout	I	Electroshocking/depletion population estimates; Spawning traps
Desert sucker	II	Electroshocking/depletion population estimates
Flannelmouth sucker	I	Electroshocking/depletion population estimates; mark/recapture population estimates; seines
Humpback chub	I	Trammel nets; mark/recapture population estimates
June sucker	I	Utah Lake: trap netting, trawling; spawning trap, light traps; Refuges: trap nets, gill nets; trammel nets
Lahontan cutthroat trout	I	Electroshocking; relative abundance
Least chub	I	Minnow traps for presence/absence, length/frequency analysis of population structure
Leatherside chub	II	Electroshocking/depletion population estimates
Longnose dace	III	Electroshocking/depletion population estimates/ relative abundance
Paiute sculpin	III	Electroshocking/depletion population estimates/ relative abundance
Razorback sucker	I	Electroshocking/ CPUE; light traps
Redside shiner	III	Electroshocking/depletion population estimates/ relative abundance
Roundtail chub	I	Trammel nets; electroshocking; mark/recapture population estimates



Speckled dace	III	Electroshocking/depletion population estimates/ relative abundance
Utah chub	III	Electroshocking/depletion population estimates/ relative abundance
Utah sucker	III	Electroshocking/depletion population estimates/ relative abundance
Virgin River chub	I	Seines
Virgin spinedace	I	Depletion sampling with seines and block nets for representative reach population counts
Woundfin	I	Seines
Yellowstone cutthroat trout	II	Electroshocking/depletion population estimates

<b>Mammal Species</b>	<b>CWCS Tier</b>	<b>Population Monitoring Methods</b>
Allen's Big-eared Bat	II	ANABAT Acoustic detection; mist-netting, night vision equipment, trip cameras
American Marten	III	Hair scent stations; trapping lines or grids
American Pika	III	Rock pile surveys via ground searches; visitor questionnaires
Big Free-tailed Bat	II	ANABAT Acoustic detection; mist-netting, night vision equipment, trip cameras
Black-footed Ferret	I	Spotlight transects; ground surveys
Brown (Grizzly) Bear - extirpated	I	Hair scent stations; radio-telemetry
Canada Lynx	I	Hair scent stations; aerial and ground winter track surveys
Dark Kangaroo Mouse	II	Live trap line transects, grids, or webs
Desert Kangaroo Rat	III	Grids, webs, or line transects of snap or live traps
Desert Shrew	III	Pitfall traps (grids and/or line transects)
Dwarf Shrew	III	Pitfall traps (grids and/or line transects)
Fringed Myotis	II	ANABAT Acoustic detection; mist-netting, night vision equipment, trip cameras
Gray Wolf – extirpated	I	Aerial winter track surveys; radio-telemetry, howling surveys
Gunnison's Prairie-dog	II	Aerial colony surveys, ground line transects
Idaho Pocket Gopher	III	Gopher kill traps; genetic data needed
Kit Fox	II	Scent station transects, track plates, trip cameras
Merriam's Shrew	III	Pitfall traps (grids, webs, and/or line transects)
Mexican Vole	II	Pitfall traps (grids, webs, and/or line transects)
Mule Deer	III	Aerial and ground surveys; line transect; area counts

Northern Flying Squirrel	III	Grids, webs, or line transects of snap or live traps
Northern River Otter	III	Ground surveys for animal sign
Northern Rock Mouse	III	Grid, webs, or line transects of snap or live traps
Olive-backed Pocket Mouse	III	Grids, webs, or line transects of snap or live traps
Preble's Shrew	II	Pitfall traps (grids and/or line transects)
Pygmy Rabbit	II	Pellet Plots; spotlight surveys; line transects;
Silky Pocket Mouse	II	Grid, webs, or line transects of snap or live traps
Spotted Bat	II	ANABAT Acoustic detection; mist-netting, night vision equipment, trip cameras
Spotted Ground Squirrel	III	Grids, webs, or line transects of snap or live traps
Stephen's Woodrat	III	Grids, webs, or line transects of snap or live traps
Thirteen-lined Ground Squirrel	III	Grids, webs, or line transects of snap or live traps
Townsend's Big-eared Bat	II	ANABAT Acoustic detection; mist-netting, night vision equipment, trip cameras
Utah Prairie-dog	I	Ground surveys
Western Red Bat	II	ANABAT Acoustic detection; mist-netting, night vision equipment, trip cameras
White-tailed Prairie-dog	II	Aerial colony surveys, ground line transects
Wolverine	III	Hair scent stations; aerial and ground winter track surveys
Wyoming Ground Squirrel	III	Grids, webs, or line transects of snap or live traps
Yuma Myotis	III	ANABAT Acoustic detection; mist-netting, night vision equipment, trip cameras

<b>Mollusk Species</b>	<b>CWCS Tier</b>	<b>Population Monitoring Methods</b>
Bear Lake spingsnail	II	Direct observation of individuals
Bifid duct pyrg	II	Direct observation of individuals
Black Canon pyrg	II	Direct observation of individuals
Black gloss	III	Direct observation of individuals
Brian Head mountainsnail	II	Direct observation of individuals
California floater	II	Direct observation of individuals
Carinate Glenwood pyrg	II	Direct observation of individuals
Cloaked physa	II	Direct observation of individuals
Creeping ancylid	III	Direct observation of individuals

Cross snaggletooth	III	Direct observation of individuals
Deseret mountainsnail	II	Direct observation of individuals
Desert springsnail	II	Direct observation of individuals
Eureka mountainsnail	II	Direct observation of individuals
Fat-whorled pondsnail	I	One square meter area counts and extrapolation
Glass physa	III	Direct observation of individuals
Glossy valvata	III	Direct observation of individuals
Hamlin Valley pyrg	II	Direct observation of individuals
Kanab ambersnail	I	Count per square area and extrapolation
Longitudinal gland pyrg	II	Direct observation of individuals
Lyrate mountainsnail	II	Direct observation of individuals
Mill Creek mountainsnail	III	Direct observation of individuals
Montane snaggletooth	III	Direct observation of individuals
Ninemile pyrg	II	Direct observation of individuals
Northwest Bonneville pyrg	II	Direct observation of individuals
Ogden Rocky mountainsnail	I	Direct observation; Population counts
Otter Creek pyrg	II	Direct observation of individuals
Ovate vertigo	III	Direct observation of individuals
Ribbed dagger	III	Direct observation of individuals
Rocky Mountain Dusksnail	III	Direct observation of individuals
Sharp sprite	III	Direct observation of individuals
Sluice snaggletooth	III	Direct observation of individuals
Smooth Glenwood pyrg	II	Direct observation of individuals
Southern Bonneville pyrg	II	Direct observation of individuals
Southern tightcoil	II	Direct observation of individuals
Sub-globose Snake pyrg	II	Direct observation of individuals
Utah physa	II	Direct observation of individuals
Western pearlshell	II	Direct observation of individuals
Wet-rock physa	II	Direct observation of individuals
Yavapai mountainsnail	II	Direct observation of individuals

<b>Reptile Species</b>	<b>CWCS Tier</b>	<b>Population Monitoring Methods</b>
Black-necked garter snake	III	Direct observation of individuals; pit fall traps
Coachwhip	III	Direct observation of individuals; pit fall traps
Common chuckwalla	II	Direct observation of individuals; pit fall traps
Common gartersnake	III	Direct observation of individuals; pit fall traps
Common kingsnake	III	Direct observation of individuals; pit fall traps
Cornsnake	II	Direct observation of individuals; pit fall traps
Desert iguana	II	Direct observation of individuals; pit fall traps
Desert night lizard	II	Direct observation of individuals; pit fall traps
Desert tortoise	I	Line transect population estimates, using individuals and signs observed
Gila monster	II	Direct observation of individuals; pit fall traps
Glossy snake	III	Direct observation of individuals; pit fall traps
Groundsnake	III	Direct observation of individuals; pit fall traps
Lesser earless lizard	III	Direct observation of individuals; pit fall traps
Long-nosed leopard lizard	III	Direct observation of individuals; pit fall traps
Long-nosed snake	III	Direct observation of individuals; pit fall traps
Many-lined skink	III	Direct observation of individuals; pit fall traps
Milksnake	III	Direct observation of individuals; pit fall traps
Mojave rattlesnake	II	Direct observation of individuals; pit fall traps
Nightsnake	III	Direct observation of individuals; pit fall traps
Plateau striped whiptail	III	Direct observation of individuals; pit fall traps
Ring-necked snake	III	Direct observation of individuals; pit fall traps
Rubber boa	III	Direct observation of individuals; pit fall traps
Sidewinder	II	Direct observation of individuals; pit fall traps
Smith's black-headed snake	III	Direct observation of individuals; pit fall traps
Smooth greensnake	II	Direct observation of individuals; pit fall traps
Sonora Mountain kingsnake	III	Direct observation of individuals; pit fall traps
Speckled rattlesnake	II	Direct observation of individuals; pit fall traps
Spotted leaf-nosed snake	III	Direct observation of individuals; pit fall traps
Western Banded Gecko	II	Direct observation of individuals; pit fall traps

Western lyresnake	III	Direct observation of individuals; pit fall traps
Western patch-nosed snake	III	Direct observation of individuals; pit fall traps
Western skink	III	Direct observation of individuals; pit fall traps
Western threadsnake	II	Direct observation of individuals; pit fall traps
Zebra-tailed lizard	II	Direct observation of individuals; pit fall traps

## **APPENDIX K . HABITAT SUMMARIES**

Key habitats and conservation focus areas are important for multiple species of conservation need. The following habitat summaries provide brief descriptions of each Key Habitat identified in Chapter 7. Information provided in each summary includes:

- 1) a basic description of the habitat;
- 2) the current abundance and condition of the habitat type in Utah;
- 3) plant and animal species commonly found in the habitat type;
- 4) species of conservation need (Tiers I, II, and III) that depend on the habitat type;
- 5) current threats facing the habitat;
- 6) conservation actions to address those threats; and
- 7) partners that are working together to protect the habitat.

# Lowland Riparian Habitat



s rivers and streams descend from the mountains to Utah's lowlands, which are below about 5,500 feet in elevation, their waters move more slowly. In their natural condition, these rivers and streams meander through the lowlands, twisting and turning through a variety of habitat types.

The vegetated areas along river banks, called riparian habitats, are home to a wide diversity of plants and animals that depend on the natural flows of water these rivers and streams carry. In fact, the wildlife found in these areas are among the most diverse in the state.

Unfortunately, Utah's lowland riparian habitats have been seriously affected by a variety of human and natural factors, and their future is uncertain.



Photo Courtesy of Lynn Chamberlain



## *Key Facts about Utah's Lowland Riparian Habitat:*

### *Very Rare*

Covering just 0.2 percent of Utah's land area, lowland river and stream banks are a very rare habitat.

### *On the Decline*

The amount of lowland riparian habitats in the state is declining.

### *Plant Life*

Lowland riparian habitats are home to Fremont cottonwood, tamarisk, netleaf hackberry, velvet ash, desert willow and squawbush.

### *Animal Life*

Mollusks, broad-tailed hummingbirds, canyon treefrogs, Allen's big-eared bats, yellow-billed cuckoos, and many other animals depend on lowland riparian habitats.

# Wetlands



**A**s their name implies, wetlands are a habitat that is often wet. Either year-round or just for a part of a year, wetlands' soil is covered with water, and a variety of plants and wildlife have adapted to these unique conditions. Often, Utah's wetlands are found in the form of marshes surrounding rivers, streams or lakes, but they can also occur in the spring and summer where water from melting snow collects.

Grasses, sedges, cattails and other wetland plants support a wide diversity of wildlife. Marshes are often filled with the sounds of songbirds, frogs, toads and other creatures, which rely on wetlands for food, water and shelter.

Hundreds of thousands of migrating shorebirds depend on the marshes surrounding the Great Salt Lake for food and rest during their cross-continental journeys.

Unfortunately, Utah's wetlands are disappearing at an alarming rate, and their wildlife is disappearing along with them. From urban development to non-native species, a variety of threats are making the future of Utah's wetlands uncertain.



## *Key Facts about Utah's Wetlands Habitat:*

### *Very Rare*

Covering just 0.2 percent of Utah's land area, wetlands are very rare in Utah.

### *Declining*

Utah's wetlands are declining in both their abundance and their condition. In addition, many of the state's remaining wetlands are suffering from human impacts.

### *Plant Life*

Species such as cattail, bulrush and sedge are native to wetlands. Tamarisk is a non-native plant that has invaded many wetlands.

### *Animal Life*

Wetlands are famous for the frogs and toads they support. Utah's wetlands are home to the Columbia spotted frog, western toad, northern leopard frog, and other species. Wetlands are also home to a variety of snails, songbirds, shorebirds, snakes, and other wildlife.







American avocet

## Species on the Edge

Utah's wetlands wildlife is declining for a number of reasons. Most importantly, their habitat is disappearing quickly. Because wetlands are so rare, and because they are home to so many species of concern, habitat loss is a critical issue.

The Utah Division of Wildlife Resources has identified 36 wetlands species of conservation need, including the following:

### ***Tier One—Very High Concern***

Columbia spotted frog, least chub

### ***Tier Two—High Concern***

Preble's shrew, western toad, desert springsnail

### ***Tier Three—Moderate Concern***

Black-necked stilt, northern leopard frog, American avocet

## What's Threatening Utah's Wetlands?

**Development**—A variety of human developments, from housing to businesses, are quickly replacing wetlands.

**Water Loss**—Water demands from the state's expanding population are pulling water from native habitats, leaving less water for wildlife.

**Energy Development**—The roads, well pads and other developments associated with oil and gas extraction damage wetland habitats.

**Pollution**—Contaminants such as selenium can accumulate in wetlands, threatening wildlife throughout the food web.

**Improper grazing practices**—When not managed properly, grazing can lead to water pollution and habitat loss in wetlands.

**Invasive plants**—Plants such as the non-native tamarisk are rapidly invading Utah's wetlands, outcompeting native plants that provide food and shelter for wetlands wildlife.

**Loss of Nearby Habitats**—Wetlands are closely connected to the habitats that surround them. As neighboring habitats disappear, wetlands are not as valuable for wildlife.

## Taking Action

Protecting Utah's wetlands will require coordinated action among a variety of partners across the state.

### **Conservation Actions**

The Utah Division of Wildlife Resources is working actively to restore Utah's wetlands. Because these areas provide important wildlife habitats and a variety of benefits for people across the state, the division has identified the following key actions to support Utah's wetlands:

1. Educate the public about the value of wetlands and how we can protect them.
2. Permanently conserve key wetlands habitats and restore degraded wetlands.
3. Partner with other government agencies and private landowners to enhance wetlands.
4. Secure water flows to wetlands.
5. Support energy development techniques that preserve wetlands.
6. Encourage developers to protect and enhance wetlands to offset wetlands development.
7. Research and monitor wetland habitats.

### **Conservation Partners**

To accomplish these tasks, the Utah Division of Wildlife Resources is partnering with a diverse group of public and private groups that include the Utah Chapter of the Audubon Society, private landowners, local governments, the Utah Reclamation Mitigation and Conservation Commission, and many others.

## Species on the Edge



Broad-tailed hummingbird

Lowland riparian wildlife is threatened by disease and habitat disturbance. Because many riparian species have a limited distribution, disturbances to each habitat is serious. Finally, scientists do not know enough about many lowland riparian species to ensure their future.

In all, lowland riparian habitats are home to 35 species that need conservation, including the following:

### ***Tier One—Very High Concern***

Yellow-billed cuckoo, southwestern willow flycatcher

### ***Tier Two—High Concern***

Arizona toad, Allen's big-eared bat, black swift, cornsnake, western threadsnake

### ***Tier Three—Moderate Concern***

Broad-tailed hummingbird, canyon treefrog, black-necked garter snake

## What's Threatening Utah's Lowland Riparian Habitat?

### **Stream straightening, or channelization—**

When rivers and streams are channelized, streamside habitats are changed. The water in the stream moves much more quickly, and many streamside plants and animals can't survive the new conditions.

**Land development—**Whether it's to create new housing or shopping opportunities or to accommodate industrial needs, many of our lowland river and stream banks are being lost to development.

**Improper Grazing Practices—**Certain grazing practices, such as overgrazing by livestock or wildlife, can affect lowland riparian habitat.

**Improper OHV Use—**Irresponsible OHV use is causing a decline in lowland riparian habitats. When operated off of designated trails, OHVs destroy streamside vegetation and disturb wildlife.

## Taking Action

Protecting Utah's lowland riparian habitats will require coordinated action among a variety of partners across the state.

### **Conservation Actions**

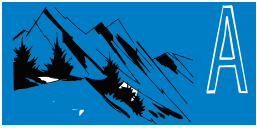
The Utah Division of Wildlife Resources has identified the following key actions needed to protect lowland riparian habitats:

1. Increase and secure water flows in our rivers.
2. Where rivers and streams are dammed, release water in ways that more closely mimic natural water patterns.
3. Restore damaged habitats.
4. Ensure appropriate grazing practices are implemented.
5. Enforce OHV regulations.

### **Conservation Partners**

The Utah Division of Wildlife Resources is working closely with the grazing industry, Utah Farm Bureau, private landowners, local governments, the Utah Association of Conservation Districts and many others to protect lowland riparian habitats.

# Mountain Riparian Habitat



Above 5,500 feet in elevation, Utah's streams run fast and steep through the mountains. And along these streams, vegetation creates a streamside habitat called a mountain riparian habitat.



Photo Courtesy of Lynn Chamberlain

Although the streams often are rocky and the water is cold, the streams and their streamside habitats are very productive and support a diversity of life. With snakes slithering through the streamside vegetation, river otters playing on the rocks, and insects and birds flying overhead, mountain riparian areas are as important to wildlife as they are scenic to people.

Despite their importance as a wildlife habitat, the quality of Utah's mountain riparian habitats is declining. A variety of human activities have combined to threaten several important wildlife species that call Utah's mountain riparian habitats home. But the Utah Division of Wildlife Resources is working with several public and private partners to restore this important wildlife habitat.

## *Key Facts about Utah's Mountain Riparian Habitat:*

### *Very Rare*

Covering just 0.2 percent of Utah's land area, mountain riparian habitats are very rare in Utah.

### *Stable but Stressed*

The amount of mountain riparian habitat in the state appears stable, but many of those habitats are being affected by human activities.

### *Plant Life*

Along Utah's mountain streams are willow, cottonwood, water birch, black hawthorn and wild rose.

### *Animal Life*

Animals that are common to Utah's mountain riparian habitats include the northern river otter, black-billed cuckoo, smooth greensnake and the rubber boa.







Northern river otter

Photo Courtesy of Ron Stewart

## Species on the Edge

Mountain riparian wildlife is threatened by a variety of human activities that affect their habitat. Because many riparian species have a limited distribution, disturbances to each habitat are of concern. In all, mountain riparian habitats are important to 21 species that need conservation, including the following:

### ***Tier One—Very High Concern***

Colorado River cutthroat trout, Bonneville cutthroat trout

### ***Tier Two—High Concern***

Smooth greensnake, western toad

### ***Tier Three—Moderate Concern***

Black-billed cuckoo, northern river otter, rubber boa

## What's Threatening Utah's Mountain Riparian Habitat?

**Stream straightening, or channelization**—When rivers and streams are channelized, water in the stream moves much more quickly and many streamside plants and animals can't survive the new conditions.

**Energy Development**—Land development and other disturbances associated with extracting oil and gas and have caused habitat loss along many mountain streams.

**Improper Grazing Practices**—When an area is overgrazed, streamside habitats can be damaged.

**Improper OHV Use**—Off-highway vehicles (OHVs) can destroy riparian habitats if not operated properly on designated trails.

**Invasive Plants**—Non-native plants introduced to Utah are outcompeting native plants in mountain riparian habitats.

**Water Development**—Dams and other water developments change natural water patterns, and can reduce the total amount of water in a habitat.

## Taking Action

Protecting Utah's mountain riparian habitats will require coordinated action among a variety of partners across the state.

### **Conservation Actions**

The Utah Division of Wildlife Resources has identified the following key actions needed to protect mountain riparian habitats:

1. Restore degraded habitats.
2. Encourage developers to restore or permanently protect habitat when they develop riparian habitats.
3. Ensure appropriate grazing practices are implemented.
4. Enforce OHV regulations; educate OHV users about the need to appropriately operate their OHVs .
5. Increase and secure water flows in our mountain streams.
6. Where dams exist on mountain streams, release water in ways that more closely mimic natural water patterns.
7. Educate the public about the importance of our mountain riparian habitats and how we can help keep them healthy.

### **Conservation Partners**

The Utah Division of Wildlife Resources is working closely with the US Forest Service, Utah Farm Bureau, private landowners, the Utah Association of Conservation Districts and others to protect mountain riparian habitats.

# Shrubsteppe



Utah's shrubsteppe habitats are rugged, wide expanses of shrubs and grasses.

The name "shrubsteppe" comes from one of the habitat's most abundant plants, sagebrush, and "steppe," which means a large, dry grassland with few or no trees.

Sagebrush is a plant that is closely associated with the American West, and has a long history of connections to both people and wildlife. From Native Americans who used sagebrush in cer-

emonies, to mule deer that depend on sagebrush as a key food source in the winter, a diversity of cultures and wildlife species have adapted to use Utah's abundant shrubsteppe habitats.



Unfortunately, shrubsteppe habitats across the state are not as healthy as they once were, and wildlife species are becoming stressed. A variety of human activities are threatening this critically important habitat, and the Utah Division of Wildlife Resources is working aggressively with its partners, including especially the Utah Partners for Conservation and Development, to address these threats.

## *Key Facts about Utah's Shrubsteppe Habitat:*

### *Common*

Shrubsteppe habitats cover over 13 percent of Utah's surface, making them among the most abundant habitats in the state.

### *On the Decline*

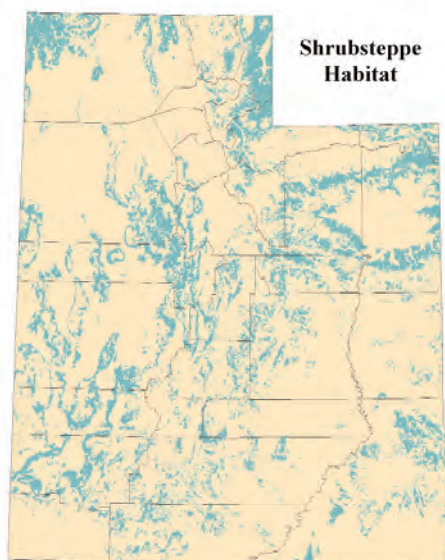
While shrubsteppe areas still remain across the state, they are in poor condition, and sagebrush plants in particular are not as healthy as they once were.

### *Plant Life*

Sagebrush is the most common plant in shrubsteppe habitats, and there are many species of sagebrush in Utah, including: big, black, low, and silver sagebrush. Other plants in this habitat include: bluebunch wheatgrass, needle grass, rabbit brush, juniper, pinyon and mountain mahogany.

### *Animal Life*

Two grouse species, Gunnison and greater sage-grouse, are specially adapted to shrubsteppe habitats. Other species found in the shrubsteppe include pygmy rabbits, sage thrasher, sage sparrow and the olive-backed pocket mouse. Mule deer also are closely connected to shrubsteppe habitats, especially in winter.





Greater sage-grouse

Photo Courtesy of Howie Garber

## Species on the Edge

As native shrubsteppe plant species decline because of a variety of human impacts, it has become increasingly difficult for wildlife to thrive. In all, shrubsteppe habitats are home to 20 species that need conservation, including the following:

### ***Tier One—Very High Concern***

Gunnison sage-grouse

### ***Tier Two—High Concern***

Greater sage-grouse, pygmy rabbit

### ***Tier Three—Moderate Concern***

Sage thrasher, sage sparrow, Brewer's sparrow, mule deer

## What's Threatening Utah's Shrubsteppe?

**Brush Control**—Brush-control activities, designed to reduce fuels for wildfires, can damage shrubsteppe habitats if performed improperly.

**Land development**—Whether it's to create new housing or shopping opportunities or to accommodate industrial needs, shrubsteppe habitats are being lost to development.

**Energy Development**—The roads, well pads and other developments associated with oil and gas extraction degrade and fragment shrubsteppe habitats.

**Fire Cycle Alteration**—Shrubsteppe habitats depend on periodic fires to stay healthy. Fire control efforts and invasive species have disrupted this natural cycle.

**Improper grazing practices**—Overgrazing threatens shrubsteppe habitats.

**Improper OHV Use**—OHVs that venture off designated trails destroy native plants and disrupt wildlife.

**Invasive Plants**—Non-native plants such as cheatgrass outcompete native plants, making large areas of shrubsteppe uninhabitable for many native species.

## Taking Action

Protecting Utah's shrubsteppe habitats will require coordinated action among a variety of partners across the state.

### **Conservation Actions**

The Utah Division of Wildlife Resources has identified the following key actions needed to protect shrubsteppe habitats:

1. Permanently protect certain key shrubsteppe habitats and restore degraded habitats wherever possible.
2. Encourage developers to permanently protect shrubsteppe habitats to offset habitat lost to development.
3. Reintroduce natural fire patterns through prescribed burns and by reducing populations of invasive plant species.
4. Research and monitor shrubsteppe habitats.
5. Establish partnerships with state and federal agencies and private landowners to address threats to shrubsteppe habitats.
6. Enforce OHV regulations; educate OHV users about the need to appropriately operate their OHVs.
7. Educate the public about Utah's shrubsteppe habitats and what we can do to manage and protect them.

### **Conservation Partners**

The Utah Division of Wildlife Resources is working closely with the Utah Farm Bureau, local governments, the U.S. Department of Agriculture's Natural Resources and Conservation Service, the U.S. Bureau of Land Management, Sportsmen for Fish and Wildlife and others to protect shrubsteppe habitats. In addition, the Utah Partners for Conservation and Development have undertaken a major watershed restoration initiative in shrubsteppe areas across Utah.

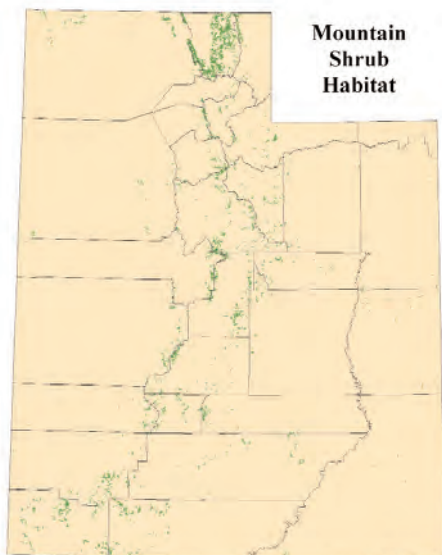


# Mountain Shrub Habitat



As dry pinyon-juniper woodlands give way to cooler, higher-elevation forests, mountain shrub habitats form a transition zone. From about 3,000 feet to 9,500 feet in elevation, these shrublands are home to small trees and shrubs that provide a rich source of food and abundant cover for a wide variety of Utah's wildlife.

Mountain shrub habitats are home to plants that produce serviceberries, chokecherries, acorns and a variety of other foods that support birds. Deer and elk also depend on mountain shrub habitats for forage, and predators such as cougars often hide among the thick shrubs waiting for opportunities to take their prey. But these habitats can only support this array of wildlife as long as they remain healthy, and, increasingly, mountain shrub habitats are under stress across Utah.



## *Key Facts about Utah's Mountain Shrub Habitat:*

### *Rare*

Covering just over one percent of Utah's land area, mountain shrub habitats are rare.

### *Under Stress*

Biologists believe many of Utah's mountain shrub habitats are affected by human impacts, and as a result this habitat is likely declining across the state.

### *Plant Life*

Smaller trees and shrubs dominate the mountain shrub habitat. Plants such as cliff rose, serviceberry, chokecherry, snowberry and bigtooth maple are common in mountain shrub habitats.

### *Animal Life*

From small creatures like the Ogden Rocky Mountainsnail to large predators like cougars, mountain shrub habitats are home to a wide variety of Utah's wildlife. Gray wolves once resided in mountain shrub, but populations of wolves are no longer found in Utah.

## Species on the Edge



Mule deer

A variety of human activities have caused changes in mountain shrub habitats that have resulted in declines in wildlife species across these habitats. In all, mountain shrub habitats are home to 14 species that need conservation, including the following:

**Tier One—Very High Concern**  
Ogden Rocky Mountainsnail

**Tier Two—High Concern**

Eureka, Lyrate, Brian Head and Deseret mountainsnails

**Tier Three—Moderate Concern**

Mule deer, desert shrew, black-throated gray warbler

## What's Threatening Utah's Mountain Shrub Habitats?

**Fire Cycle Alteration**—Mountain shrub habitats are dependent on natural fire cycles that have been disrupted by human activities, making fires now either too frequent or too few.

**Invasive Plant Species**—Introduced plants are outcompeting native plants, quickly making large areas of once-productive habitat uninhabitable for many native species.

**Brush Control**—Brush-control activities, designed to reduce fuels for wildfires, can damage mountain shrub habitats if performed improperly.

**Improper Grazing Practices**—Overgrazing threatens some mountain shrub habitats.

**Energy Development**—The roads, well pads and other developments associated with oil and gas extraction can damage mountain shrub habitats.

## Taking Action

Protecting Utah's mountain shrub habitats will require coordinated action among a variety of partners across the state.

### Conservation Actions

The Utah Division of Wildlife Resources has identified the following key actions needed to protect mountain shrub habitats:

1. Control invasive vegetation and plant desirable plants.
2. Reintroduce natural fire patterns with prescribed burns and other methods.
3. Work with land managers to create better energy development methods, and to set aside healthy habitat when areas must be developed.
4. Increase efforts in research and monitoring for wildlife populations.
5. Ensure appropriate grazing practices are implemented.
6. Educate the public about the importance of mountain shrub habitats and how to help keep them healthy.

### Conservation Partners

Utah Division of Wildlife Resources is working closely with the grazing industry, private landowners, the U.S. Department of Agriculture's Forest Service and private forest and mining industries to protect mountain shrub habitats.



# Flowing-Water Habitat



Photo Courtesy of Lynn Chamberlain



Biologists call bodies of flowing-water *lotic* habitats. In Utah, these habitats are diverse, ranging from tiny mountain rivulets to huge, boiling rapids on the state's largest rivers.

Here in the second-driest state in the nation, the same river may be dry during one part of the year and overtopping its banks at another. Lotic habitats can be shallow or deep, sunny or shaded, waters can be slow or swift, and bottoms can be covered with gravel or sand. Wildlife native to this habitat have adapted to those variable conditions, and the habitat and the wildlife it supports plays an important role in Utah's economy.

But many of Utah's flowing-water habitats are not thriving. A variety of human activities are challenging our rivers and streams. Because lotic habitats are important to all Utahns, the Utah Division of Wildlife Resources is working with a diversity of partners to ensure the future of Utah's flowing-water habitats.

## *Key Facts about Utah's Flowing-Water Habitat:*

### *Very Rare*

Covering less than 0.1 percent of Utah's land area, flowing-water habitats are very rare in Utah.

### *On the Decline*

Utah's biologists think that the state's flowing-water habitats are less abundant and less healthy than they once were.

### *Plant Life*

Plants in Utah's flowing-water habitats provide both food and cover to a diversity of aquatic wildlife. Other types of organisms, including bacteria and algae, also help capture the sun's energy and play a key role at the base of the food web.

### *Animal Life*

Aquatic wildlife in lotic habitats range from microscopic animals; to smaller animals such as snails, bivalves and insects; to large fish species. Anglers especially value the trout species that are found in flowing-water habitats.



## Species on the Edge

Flowing-water wildlife is threatened by a variety of human activities that are degrading their habitat. These threats affect all flowing-water wildlife, but they are especially dangerous for the 28 species of conservation need that live in flowing-water habitats.

The following are examples of some of the species of conservation need that inhabit Utah's flowing-water habitats:

**Tier One—Very High Concern**  
Colorado River and Bonneville cutthroat trout, bonytail, woundfin, razorback sucker

**Tier Two—High Concern**  
Desert sucker, Yellowstone cutthroat trout, leatherside chub

**Tier Three—Moderate Concern**  
Utah sucker, mottled sculpin



Bonneville cutthroat trout

## What's Threatening Utah's Flowing-Water Habitat?

**Water Loss**—Water demands from the state's expanding population are pulling water from rivers and streams, leaving less for wildlife.

**Nutrients and Sediments**—A variety of human activities, from riding off-highway vehicles (OHVs) inappropriately to building roads to grazing livestock improperly, can cause soil and other sediments to run into rivers and streams. If not well managed, fertilizers and the nutrients they contain also run into streams from farms, causing microscopic plants to grow too fast. Sediments and microscopic plants can cloud out sunlight critical for maintaining life underwater.

**Pollution**—Contaminants such as mercury threaten both fish and people.

**Channelization**—When rivers and streams are straightened, waters run faster, making it difficult for some vegetation and wildlife to survive.

**Invasive Species**—A variety of plant and animal species have been introduced to our rivers and streams, and many native plants and animals can't compete.

## Taking Action

Protecting Utah's flowing-water habitats will require coordinated action among a variety of partners across the state.

### Conservation Actions

The Utah Division of Wildlife Resources has identified the following key actions needed to protect flowing-water habitats:

1. Restore degraded rivers and streams, including enhancing the ability of waterways to flow naturally, where possible.
2. Secure and increase water flows in our rivers and streams.
3. Reduce or eliminate pollution by sediment, fertilizers and chemicals.
4. Ensure appropriate grazing practices are implemented.
5. Monitor wildlife populations and research habitat needs to help prioritize actions.
6. Educate the public about the value of our streams and rivers.

### Conservation Partners

The Utah Division of Wildlife Resources is working closely with a broad spectrum of partners to protect flowing-water habitats, including the following: the grazing industry, Utah Reclamation Mitigation and Conservation Commission, Trout Unlimited, U.S. Bureau of Reclamation, U.S. Fish and Wildlife Service, local governments, Utah Division of Water Resources, Central Utah Water Conservation District, Washington County Water Conservancy District, U.S. Bureau of Land Management and others.



# Wet Meadows



Like grasslands, wet meadows are home to grasses and sedges and few, if any, trees. But, unlike grasslands, wet meadows are saturated with water during most of the year.



Occurring between about 3,300 feet and 9,800 feet in elevation, wet meadows are uncommon in Utah. But where they do occur, a wide variety of plants and wildlife have adapted to take advantage of the wet conditions. Unfortunately, these habitats are declining across the state, and the wildlife that calls them home is becoming increasingly threatened.

## Key Facts about Utah's Wet Meadow Habitat:

### *Very Rare*

Covering less than 0.1 percent of Utah's land area, wet meadow habitats are very rare in Utah.

### *On the Decline*

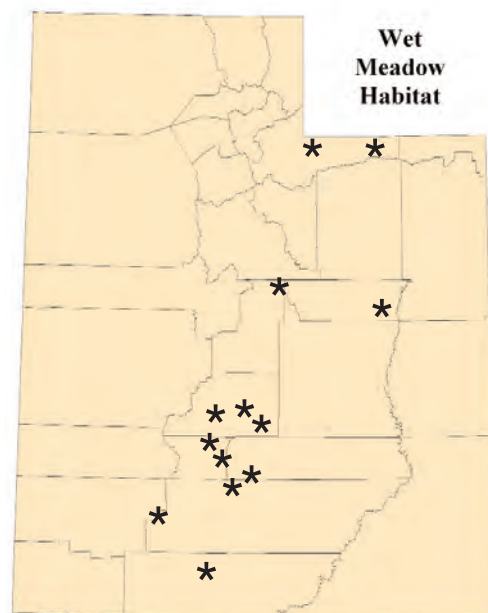
With many of the state's remaining wet meadows affected by human impacts, biologists think that this habitat is declining across the state.

### *Plant Life*

Wet meadows are home to sedges, rushes and reedgrasses.

### *Animal Life*

The wet conditions in Utah's wet meadows are favorable for amphibians like the Columbia spotted frog. Snakes such as garter snakes and the smooth greensnake are also often found in wet meadows.



*Note: Due to the small size of most wet meadows, they are not visible on a map of this scale.*



Columbia spotted frog

## Species on the Edge

Wet meadow wildlife is threatened by both natural factors, such as drought, and human disturbances, such as habitat loss. Because wet meadows are rare, disturbances to each habitat are serious. Wet meadow habitats are home to four species of conservation need:

***Tier One—Very High Concern***

Columbia spotted frog

***Tier Two—High Concern***

Bobolink, smooth greensnake

***Tier Three—Moderate Concern***

Common gartersnake

## What's Threatening Utah's Wet Meadow Habitat?

**Loss of nearby habitats**—Wet meadows are closely connected to the habitats that surround them. As neighboring habitats disappear, wetlands are not as valuable for wildlife.

**Land development**—Whether it's to create new housing or to accommodate industrial needs, many of our wet meadows are being lost to development.

**Drought**—Utah's prolonged drought has caused some wet meadow habitats to dry up.

**Improper Grazing Practices**—Over-grazing can create long-term damage in wet meadows.

**Improper OHV use**—When not operated on designated trails, off-highway vehicles (OHVs) disrupt wildlife, compress the soil and cause long-term damage to wet meadow plant life.

**Water development**—Utah's expanding population is demanding more and more water, making less water available for wildlife habitats such as wet meadows.

## Taking Action

Protecting Utah's wet meadows will require coordinated action among a variety of partners across the state.

### Conservation Actions

The Utah Division of Wildlife Resources has identified the following key actions needed to protect wet meadow habitats:

1. Increase and secure water flows in our state's waterways.
2. Permanently protect certain wet meadow habitats using tools such as conservation easements.
3. Restore degraded habitats to more natural conditions where possible.
4. Partner with other government agencies and private landowners to enhance wet meadows.
5. Enforce OHV regulations.
6. Research and monitor wet meadow habitats.
7. Educate the public about the value of wet meadows and how we can help ensure their future.

### Conservation Partners

The Utah Division of Wildlife Resources is working closely with local governments, the Utah Farm Bureau, private landowners, the grazing industry, the Utah Reclamation Mitigation and Conservation Commission, the Utah Chapter of the Audubon Society and others to protect wet meadow habitats.

# Grasslands



Many people associate grasslands with pioneers who moved west across North America. Pioneers called these rolling landscapes of grasses and sedges prairies, and first encountered them after crossing the Mississippi River. Unlike Utah's grasslands, the grasslands found to the east of Utah are called tallgrass prairies because the greater rainfall they receive supports grasses as high as eleven feet tall. Utah's drier climate supports shortgrass prairies.

From songbirds soaring overhead to snakes slithering among the grasses, grasslands are rich with wildlife. Raptors often can be found gliding above the grass, searching for small mammals such as mice, ground squirrels and prairie-dogs that occasionally emerge from their underground homes. While Utah's grasslands remain important wildlife habitat, these habitats are not as healthy as they were when the pioneers first encountered them.



## *Key Facts about Utah's Grassland Habitat:*

### *Rare*

Covering about three-and-a-half percent of Utah's land area, grasslands are not very abundant in Utah.

### *Stable*

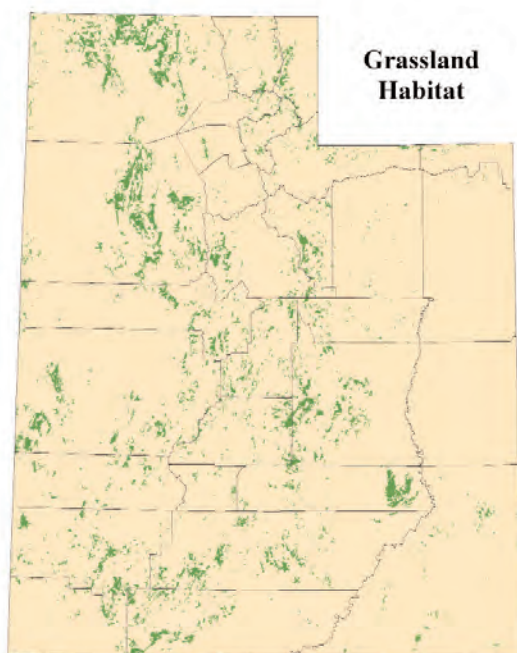
Biologists believe that Utah's grasslands are in a relatively stable condition, but some of the state's grasslands are feeling the effects of human activities.

### *Plant Life*

The most abundant plants in grasslands are grasses, including wheatgrass, bluebunch and bluegrass, but you can also find wildflowers such as yarrow and Richardson's geranium here.

### *Animal Life*

Grasslands are probably best known for the small mammals that call these habitats home, including black-footed ferrets and several species of prairie-dog.





## Species on the Edge

The wildlife that calls grasslands home is threatened by a variety of human activities that are degrading their habitat. Because grasslands are home to 22 species of conservation need, protecting grasslands is a key to keeping these species healthy. The following are some of the many species in need of conservation in grasslands:

### ***Tier One—Very High Concern***

Black-footed ferret, Utah prairie-dog

### ***Tier Two—High Concern***

Long-billed curlew, grasshopper sparrow, Gunnison's prairie-dog, white-tailed prairie-dog

### ***Tier Three—Moderate Concern***

Idaho pocket gopher, coach-whip, glossy snake

## What's Threatening Utah's Grassland Habitat?

**Development**—Many of Utah's grasslands have given way to human developments. Those that remain are often broken up by developments, leaving only a patchwork of grasslands that can be difficult for wildlife to navigate.

**Improper grazing practices**—Overgrazing threatens some grassland habitats.

**Invasive plant species**—Certain non-native plants, such as cheatgrass, have invaded grassland habitats and are outcompeting native grasses. Cheatgrass and other noxious weeds do not provide the food and cover that native wildlife depends upon.

**Fire cycle alteration**—Wildlife native to grasslands have adapted to a certain natural fire cycle. Cheatgrass and other invasive species, however, encourage more frequent fires, making it difficult for native wildlife to survive.



*Black-footed ferret*

## Taking Action

Protecting Utah's grasslands will require coordinated action among a variety of partners across the state.

### **Conservation Actions**

The Utah Division of Wildlife Resources has identified the following key actions needed to protect Utah's grasslands:

1. Ensure proper grazing practices are implemented.
2. Restore degraded habitats and work to permanently conserve healthy grasslands.
3. Restore natural fire cycles where possible.
4. Remove invasive plants, plant desirable vegetation and educate the public about how to help prevent the spread of invasive plants.

### **Conservation Partners**

The Utah Division of Wildlife Resources is working closely with the grazing industry, the U.S. Bureau of Land Management, the Utah Association of Conservation Districts, the Rocky Mountain Elk Foundation, local governments, USDA's Natural Resources Conservation Service and others to protect grasslands.

# Standing-Water Habitat



Below the still surface of Utah's reservoirs, lakes,

ponds and pools are habitats that are as dynamic as any ecosystem on land. Biologists call these bodies of standing water *lentic* habitats, and they range from tiny desert springs to the world-famous Great Salt Lake.

Complex communities of bacteria, algae, plants and insects support a variety of snails, bivalves and fish.

Many of these waters are well known by anglers for the bass, catfish, perch and trout species they support. These waters also are fished by a variety of bird species, including eagles and osprey.

Standing-water habitats play a critical role in providing Utah's human population with drinking water, recreational opportunities and electricity. Despite their value to humans, however, lentic habitats are increasingly at risk from human activities. The Utah Division of Wildlife Resources is working aggressively to ensure the future of this important habitat.



Photo Courtesy of Lynn Chamberlain

## *Key Facts about Utah's Standing-Water Habitat:*

### *Rare*

Standing-water habitats cover just three-and-a-half percent of Utah's land area, with much of this area being the Great Salt Lake.

### *Under Stress*

Biologists think that much of Utah's standing-water habitats are suffering from human impacts. As a result, these habitats may be declining, which is significant because reservoirs, lakes and ponds are home to a large number of sensitive species.

### *Plant Life*

In addition to the plants that provide food and cover for a variety of standing-water wildlife, bacteria and algae play an important role in standing water habitats at the base of the habitat's food web.

### *Animal Life*

Lentic habitats are home to a diversity of animal life, from microscopic plankton to snails and insects to fish. Frogs and toads are often found near standing water, and a variety of birds—including the American white pelican, eagles and osprey—feed on wildlife found in lentic habitats.



## Species on the Edge



Osprey

Photo Courtesy of Ron Stewart

Aquatic wildlife species and their standing-water habitats are both threatened by a variety of human and natural impacts. In all, standing-water habitats are home to 16

species of conservation need, including the following:

### ***Tier One—Very High Concern***

Least chub, June sucker, Bonneville cutthroat trout, Colorado River cutthroat trout

### ***Tier Two—High Concern***

American white pelican, Bonneville cisco, Bear Lake whitefish

### ***Tier Three—Moderate Concern***

Osprey, glossy valvata

## What's Threatening Utah's Standing-Water Habitats?

**Water Loss**—Water demands from the state's expanding population are consuming more water from rivers and streams, leaving less for wildlife.

**Nutrients and Sediments**—Large amounts of nutrients, such as fertilizers, and sediments can damage standing-water habitats by causing the water to become too cloudy for sunlight to penetrate.

**Dam Safety**—Unsafe dams could collapse or be purposefully breached, quickly destroying the reservoirs they hold.

**Pollution**—Contaminants such as mercury from industrial and commercial activities threaten both fish and people.

**Invasive Species**—A variety of plant and animal species have been introduced to our waters, and many native plants and animals can't compete. Carp, for example, have caused native fish numbers in some waters to decline.

## Taking Action

Protecting Utah's standing-water habitats will require coordinated action among a variety of partners across the state.

### **Conservation Actions**

The Utah Division of Wildlife Resources has identified the following key actions needed to protect Utah's standing-water habitats:

1. Better manage fertilizer use and ensure proper grazing practices.
2. Support pollution control efforts.
3. Control harmful nonnative plant and animal species.
4. Secure "conservation pools" and other methods of ensuring water for aquatic species.
5. Remove invasive plants, plant desirable plants and educate the public about how to help prevent the spread of invasive plants.
6. Maintain dams that provide key standing-water habitats.
7. Monitor and research water quality and wildlife populations dependent upon standing-water habitats.

### **Conservation Partners**

Utah Division of Wildlife Resources is working closely with local governments, the Utah Reclamation Mitigation and Conservation Commission, U.S. Fish and Wildlife Service, U.S. Natural Resources Conservation Service, U.S. Bureau of Land Management, Trout Unlimited, the Utah Farm Bureau, the Central Utah Water Conservancy District, the Provo River Water Users, the Jordan Valley Water Conservancy District, the Audubon Society, and others to protect standing-water habitats.



# Aspen Forest



**A**lso called quaking aspen for the way their leaves quiver in breezes, aspen trees and the forests they create are as scenic as they are important for wildlife. Each fall, aspen leaves turn bright yellow, attracting tourists to Utah's mountains, where the forests occur at elevations above 5,600 feet.

Although few other trees inhabit the aspen forest, these areas are home to a wide variety of shrubs and wildflowers that fill the forest floor. In turn, this diversity of plant life supports a busy array of wildlife.

Changes in natural fire cycles and other disturbances, however, are making aspen forests increasingly rare across Utah. Without disturbances to open up the forest and help the aspens spread, spruce and fir forests are quickly overtaking aspen forests.

## *Key Facts about Utah's Aspen Forests:*

### *Rare*

Covering just three percent of Utah's land area, aspen forests are not very abundant in Utah.

### *Under Stress*

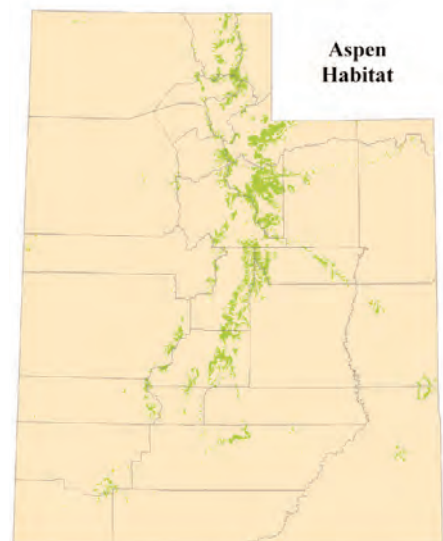
Scientists believe that both the amount and condition of aspen forests are declining.

### *Plant Life*

Aspen trees are the dominant trees in the aspen forest, but shrubs such as snowberry and wildflowers such as mountain bluebells are often found on the forest floor.

### *Animal Life*

Several species of woodpeckers can be found in aspen forests, where they use the trees' soft wood to create homes. Northern goshawks and owls can also be found above the forest, while voles and weasels can be found burrowing beneath the forest.





## Species on the Edge

Aspen forests are rapidly declining across the state, putting wildlife under pressure to quickly adapt. Aspen forests are home to four species of conservation need:

**Tier One—Very High Concern**  
Northern goshawk

**Tier Two—High Concern**  
Yavapai mountainsnail  
Mexican vole

**Tier Three—Moderate Concern**  
Williamson's sapsucker



Northern goshawk

## What's Threatening Utah's Aspen Forests?

**Land Development**—Whether it's to create new housing or to accommodate other needs, many of our aspen forests are being lost to development.

**Fire Cycle Alteration**—Aspen forests are well adapted to regular fires. In fact, these forests rely on fires to remain healthy. But over the past 100 years, fires have been suppressed across the West. Without regular fires in aspen forests, many aspen stands are being replaced with other habitats.

**Improper Grazing Practices**—Certain grazing practices, such as overgrazing by livestock or wildlife, have damaged some aspen forests.

## Taking Action

Protecting Utah's aspen forests will require coordinated action among a variety of partners across the state.

### Conservation Actions

The Utah Division of Wildlife Resources has identified the following key actions needed to conserve aspen forests:

1. Restore natural fire cycles where appropriate.
2. Ensure appropriate grazing practices are implemented.
3. Restore damaged habitats.
4. Research and monitor both aspen forest habitats and the sensitive species they contain.
5. Partner with federal and state agencies and private landowners.
6. Educate the public about how to help protect and sustain aspen forests.

### Conservation Partners

The Utah Division of Wildlife Resources is working closely with the grazing industry, private forest industries, the U.S. Department of Agriculture's Forest Service and Natural Resources Conservation Service, and others to manage, restore and protect aspen forests.

## APPENDIX L . KEY HABITATS AND ASSOCIATED SPECIES

### Utah Species of Conservation Need by Habitat Conservation Priority

Species that use LOWLAND RIPARIAN as primary or secondary habitat.							
Primary		Tier Level	Group	Secondary		Tier Level	Group
Arizona Toad	<i>Bufo microscaphus</i>	Tier II	Amphibian	Northern Leopard Frog	<i>Rana pipiens</i>	Tier III	Amphibian
Canyon Treefrog	<i>Hyla arenicolor</i>	Tier III	Amphibian	Bell's Vireo	<i>Vireo bellii</i>	Tier III	Bird
Pacific Treefrog	<i>Pseudacris regilla</i>	Tier III	Amphibian	Crissal Thrasher	<i>Toxostoma crissale</i>	Tier III	Bird
Abert's Towhee	<i>Pipilo aberti</i>	Tier III	Bird	Gambel's Quail	<i>Callipepla gambelii</i>	Tier III	Bird
Bald Eagle	<i>Haliaeetus leucocephalus</i>	Tier I	Bird	Lewis's Woodpecker	<i>Melanerpes lewis</i>	Tier II	Bird
Bell's Vireo	<i>Vireo bellii</i>	Tier III	Bird	Mexican Spotted Owl	<i>Strix occidentalis lucida</i>	Tier I	Bird
Black Swift	<i>Cypseloides niger</i>	Tier II	Bird	Peregrine Falcon	<i>Falco peregrinus</i>	Tier III	Bird
Broad-tailed Hummingbird	<i>Selasphorus platycercus</i>	Tier III	Bird	Redside Shiner	<i>Richardsonius balteatus</i>	Tier III	Fish
Lucy's Warbler	<i>Vermivora luciae</i>	Tier III	Bird	Speckled Dace	<i>Rhinichthys osculus</i>	Tier III	Fish
Southwestern Willow Flycatcher	<i>Empidonax traillii</i>	Tier I	Bird	Utah Chub	<i>Gila atraria</i>	Tier III	Fish
Yellow-billed Cuckoo	<i>Coccyzus americana</i>	Tier I	Bird	Utah Sucker	<i>Catostomus ardens</i>	Tier III	Fish
Allen's Big-eared Bat	<i>Idionycteris phyllotis</i>	Tier II	Mammal	Northern River Otter	<i>Lontra canadensis</i>	Tier III	Mammal
Big Free-tailed Bat	<i>Nyctinomops macrotis</i>	Tier II	Mammal	Smith's Black-headed Snake	<i>Tantilla hobartsmithi</i>	Tier III	Reptile
Western Red Bat	<i>Lasiurus blossevillii</i>	Tier II	Mammal	Western Lyresnake	<i>Trimorphodon biscutatus</i>	Tier III	Reptile
Yuma Myotis	<i>Myotis yumaensis</i>	Tier III	Mammal				
Ribbed Dagger	<i>Pupoides hordaceus</i>	Tier III	Mollusk				
Sluice Snaggletooth	<i>Gastrocopta ashmuni</i>	Tier III	Mollusk				
Black-necked Garter Snake	<i>Thamnophis cyrtopsis</i>	Tier III	Reptile				
Cornsnake	<i>Elaphe guttata</i>	Tier II	Reptile				
Western Threadsnake	<i>Leptotyphlops humilis</i>	Tier II	Reptile				

Species that use WETLAND as primary or secondary habitat.							
Primary		Tier Level	Group	Secondary		Tier Level	Group
Northern Leopard Frog	<i>Rana pipiens</i>	Tier III	Amphibian	Arizona Toad	<i>Bufo microscaphus</i>	Tier II	Amphibian
Western Toad	<i>Bufo boreas</i>	Tier II	Amphibian	American White Pelican	<i>Pelecanus erythrorhynchos</i>	Tier II	Bird
American Avocet	<i>Recurvirostra americana</i>	Tier III	Bird	Wet-rock Physa	<i>Physella zionis</i>	Tier II	Mollusk
Black-necked Stilt	<i>Himantopus mexicanus</i>	Tier III	Bird				
Preble's Shrew	<i>Sorex preblei</i>	Tier II	Mammal				
Bear Lake Springsnail	<i>Pyrgulopsis pilsbryana</i>	Tier II	Mollusk				
Bifid Duct Pyrg	<i>Pyrgulopsis peculiaris</i>	Tier II	Mollusk				
Black Canyon Pyrg	<i>Pyrgulopsis plicata</i>	Tier II	Mollusk				
Carinate Glenwood Pyrg	<i>Pyrgulopsis inopinata</i>	Tier II	Mollusk				
Cloaked Physa	<i>Physa megalochlamys</i>	Tier II	Mollusk				
Creeping Ancyliid	<i>Ferrissia rivularis</i>	Tier III	Mollusk				
Desert Springsnail	<i>Pyrgulopsis deserta</i>	Tier II	Mollusk				
Glass Physa	<i>Physa skinneri</i>	Tier III	Mollusk				
Glossy Valvata	<i>Valvata humeralis</i>	Tier III	Mollusk				
Hamlin Valley Pyrg	<i>Pyrgulopsis hamlinensis</i>	Tier II	Mollusk				
Longitudinal Gland Pyrg	<i>Pyrgulopsis anguina</i>	Tier II	Mollusk				
Ninemile Pyrg	<i>Pyrgulopsis nonaria</i>	Tier II	Mollusk				
Northwest Bonneville Pyrg	<i>Pyrgulopsis variegata</i>	Tier II	Mollusk				
Otter Creek Pyrg	<i>Pyrgulopsis fusca</i>	Tier II	Mollusk				
Rocky Mountain Dusksnail	<i>Colligyrus greggi</i>	Tier III	Mollusk				
Sharp Sprite	<i>Promenetus exacuus</i>	Tier III	Mollusk				
Smooth Glenwood Pyrg	<i>Pyrgulopsis chamberlini</i>	Tier II	Mollusk				
Southern Bonneville Pyrg	<i>Pyrgulopsis transversa</i>	Tier II	Mollusk				
Sub-globose Snake Pyrg	<i>Pyrgulopsis saxatilis</i>	Tier II	Mollusk				
Utah Physa	<i>Physella utahensis</i>	Tier II	Mollusk				
Common Gartersnake	<i>Thamnophis sirtalis</i>	Tier III	Reptile				

Species that use MOUNTAIN RIPARIAN as primary or secondary habitat.							
Primary		Tier Level	Group	Secondary		Tier Level	Group
Black-billed Cuckoo	<i>Coccyzus erythrophthalmus</i>	Tier III	Bird	Pacific Treefrog	<i>Pseudacris regilla</i>	Tier III	Amphibian
Northern River Otter	<i>Lontra canadensis</i>	Tier III	Mammal	Western Toad	<i>Bufo boreas</i>	Tier II	Amphibian
Black Gloss	<i>Zonitoides nitidus</i>	Tier III	Mollusk	Broad-tailed Hummingbird	<i>Selasphorus platycercus</i>	Tier III	Bird
Cross Snaggletooth	<i>Gastrocopta quadridens</i>	Tier III	Mollusk	Southwestern Willow Flycatcher	<i>Empidonax trailii</i>	Tier I	Bird
Montane Snaggletooth	<i>Gastrocopta pilsbryana</i>	Tier III	Mollusk	Leatherside Chub	<i>Gila copei</i>	Tier II	Fish
Rubber Boa	<i>Charina bottae</i>	Tier III	Reptile	Longnose Dace	<i>Rhinichthys cataractae</i>	Tier III	Fish
Smooth Greensnake	<i>Opheodrys vernalis</i>	Tier II	Reptile	Paiute Sculpin	<i>Cottus beldingi</i>	Tier III	Fish
				Yellowstone Cutthroat Trout	<i>Oncorhynchus clarki bouvieri</i>	Tier II	Fish
				Western Pearlshell	<i>Margaritifera falcata</i>	Tier II	Mollusk
				Sonora Mountain Kingsnake	<i>Lampropeltis pyromelana</i>	Tier III	Reptile

Species that use SHRUBSTEPPE as primary and secondary habitat.							
Primary		Tier Level	Group	Secondary		Tier Level	Group
Brewer's Sparrow	<i>Spizella breweri</i>	Tier III	Bird	Ferruginous Hawk	<i>Buteo regalis</i>	Tier II	Bird
Greater Sage-grouse	<i>Centrocercus urophasianus</i>	Tier II	Bird	Gunnison Sage-grouse	<i>Centrocercus minimus</i>	Tier I	Bird
Gunnison Sage-grouse	<i>Centrocercus minimus</i>	Tier I	Bird	Dark Kangaroo Mouse	<i>Microdipodops megacephalus</i>	Tier II	Mammal
Sage Sparrow	<i>Amphispiza belli</i>	Tier III	Bird	Idaho Pocket Gopher	<i>Thomomys idahoensis</i>	Tier III	Mammal
Sage Thrasher	<i>Oreoscoptes montanus</i>	Tier III	Bird	Silky Pocket Mouse	<i>Perognathus flavus</i>	Tier II	Mammal
Sharp-tailed Grouse	<i>Tympanuchus phasianellus</i>	Tier II	Bird	Long-nosed Snake	<i>Rhinocheilus lecontei</i>	Tier III	Reptile
Merriam's Shrew	<i>Sorex merriami</i>	Tier III	Mammal	Milksnake	<i>Lampropeltis triangulum</i>	Tier III	Reptile
Mule Deer	<i>Odocoileus hemionus</i>	Tier III	Mammal	Ring-necked Snake	<i>Diadophis punctatus</i>	Tier III	Reptile
Olive-backed Pocket Mouse	<i>Perognathus fasciatus</i>	Tier III	Mammal	Zebra-tailed Lizard	<i>Callisaurus draconoides</i>	Tier II	Reptile
Pygmy Rabbit	<i>Brachylagus idahoensis</i>	Tier II	Mammal				
Wyoming Ground Squirrel	<i>Spermophilus elegans</i>	Tier III	Mammal				

Species that use MOUNTAIN SHRUB as primary and secondary habitat.							
Primary		Tier Level	Group	Secondary		Tier Level	Group
Brian Head Mountainsnail	<i>Oreohelix parawanensis</i>	Tier II	Mollusk	Black-throated Gray Warbler	<i>Dendroica nigrescens</i>	Tier III	Bird
Deseret Mountainsnail	<i>Oreohelix peripherica</i>	Tier II	Mollusk	American Pika	<i>Ochotona princeps</i>	Tier III	Mammal
Eureka Mountainsnail	<i>Oreohelix eurekensis</i>	Tier II	Mollusk	Desert Shrew	<i>Notiosorex crawfordi</i>	Tier III	Mammal
Lyrate Mountainsnail	<i>Oreohelix haydeni</i>	Tier II	Mollusk	Mule Deer	<i>Odocoileus hemionus</i>	Tier III	Mammal
				Townsend's Big-eared Bat	<i>Plecotus townsendii</i>	Tier II	Mammal
				Many-lined Skink	<i>Eumeces multivirgatus</i>	Tier III	Reptile
				Western Skink	<i>Eumeces skiltonianus</i>	Tier III	Reptile

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Species that use WATER-LOTIC as primary and secondary habitat.							
Primary		Tier Level	Group	Secondary		Tier Level	Group
Bluehead Sucker	<i>Catostomus discobolus</i>	Tier I	Fish	Canyon Treefrog	<i>Hyla arenicolor</i>	Tier III	Amphibian
Bonytail	<i>Gila elegans</i>	Tier I	Fish	Osprey	<i>Pandion haliaetus</i>	Tier III	Bird
Colorado Pikeminnow	<i>Ptychocheilus lucuis</i>	Tier I	Fish	June Sucker	<i>Chasmistes liorus</i>	Tier I	Fish
Desert Sucker	<i>Catostomus clarki</i>	Tier II	Fish				
Flannelmouth Sucker	<i>Catostomus latipinnis</i>	Tier I	Fish				
Humpback chub	<i>Gila cypha</i>	Tier I	Fish				
Leatherside Chub	<i>Gila copei</i>	Tier II	Fish				
Longnose Dace	<i>Rhinichthys cataractae</i>	Tier III	Fish				
Paiute Sculpin	<i>Cottus beldingi</i>	Tier III	Fish				
Razorback Sucker	<i>Xyrauchen texanus</i>	Tier I	Fish				
Redside Shiner	<i>Richardsonius balteatus</i>	Tier III	Fish				
Roundtail chub	<i>Gila robusta</i>	Tier I	Fish				
Speckled Dace	<i>Rhinichthys osculus</i>	Tier III	Fish				
Utah Chub	<i>Gila atraria</i>	Tier III	Fish				
Utah Sucker	<i>Catostomus ardens</i>	Tier III	Fish				
Virgin River Chub	<i>Gila seminuda</i>	Tier I	Fish				
Virgin Spinedace	<i>Lepidomeda mollispinis</i>	Tier I	Fish				
Woundfin	<i>Plagopterus argentissimus</i>	Tier I	Fish				
Yellowstone Cutthroat Trout	<i>Oncorhynchus clarki bouvieri</i>	Tier II	Fish				
California Floater	<i>Anodonta californiensis</i>	Tier II	Mollusk				
Western Pearlshell	<i>Margaritifera falcata</i>	Tier II	Mollusk				

Species that use WET MEADOW as primary or secondary habitat.							
Primary		Tier Level	Group	Secondary		Tier Level	Group
Bobolink	<i>Dolichonyx oryzivorus</i>	Tier II	Bird	Common Gartersnake	<i>Thamnophis sirtalis</i>	Tier III	Reptile
				Smooth Greensnake	<i>Opheodrys vernalis</i>	Tier II	Reptile

Species that use GRASSLAND as primary and secondary habitat.							
Primary		Tier Level	Group	Secondary		Tier Level	Group
Grasshopper Sparrow	<i>Ammodramus savannarum</i>	Tier II	Bird	Great Plains Toad	<i>Bufo cognatus</i>	Tier III	Amphibian
Long-billed Curlew	<i>Numenius americanus</i>	Tier II	Bird	Mexican Spadefoot	<i>Spea multiplicata</i>	Tier III	Amphibian
Black-footed ferret	<i>Mustela nigripes</i>	Tier I	Mammal	Plains Spadefoot	<i>Spea bombifrons</i>	Tier III	Amphibian
Gunnison's Prairie-dog	<i>Cynomys gunnisoni</i>	Tier II	Mammal	Burrowing Owl	<i>Athene cunicularia</i>	Tier II	Bird
Idaho Pocket Gopher	<i>Thomomys idahoensis</i>	Tier III	Mammal	Sharp-tailed Grouse	<i>Tympanuchus phasianellus</i>	Tier II	Bird
Silky Pocket Mouse	<i>Perognathus flavus</i>	Tier II	Mammal	Merriam's Shrew	<i>Sorex merriami</i>	Tier III	Mammal
Spotted Ground Squirrel	<i>Spermophilus spilosoma</i>	Tier III	Mammal	Olive-backed Pocket Mouse	<i>Perognathus fasciatus</i>	Tier III	Mammal
Thirteen-lined Ground Squirrel	<i>Spermophilus tridecemlineatus</i>	Tier III	Mammal	Lesser Earless Lizard	<i>Holbrookia maculata</i>	Tier III	Reptile
Utah Prairie-dog	<i>Cynomys parvidens</i>	Tier I	Mammal				
White-tailed Prairie-dog	<i>Cynomys leucurus</i>	Tier II	Mammal				
Coachwhip	<i>Masticophis flagellum</i>	Tier III	Reptile				
Glossy Snake	<i>Arizona elegans</i>	Tier III	Reptile				

Species that use WATER-LENTIC as primary or secondary habitat.							
Primary		Tier Level	Group	Secondary		Tier Level	Group
American White Pelican	<i>Pelecanus erythrorhynchos</i>	Tier II	Bird	Caspian Tern	<i>Sterna caspia</i>	Tier III	Bird
Osprey	<i>Pandion haliaetus</i>	Tier III	Bird	California Floater	<i>Anodonta californiensis</i>	Tier II	Mollusk
Bear Lake Sculpin	<i>Cottus extensus</i>	Tier II	Fish	Glass Physa	<i>Physa skinneri</i>	Tier III	Mollusk
Bear Lake Whitefish	<i>Prosopium abyssicola</i>	Tier II	Fish	Glossy Valvata	<i>Valvata humeralis</i>	Tier III	Mollusk
Bonneville Cisco	<i>Prosopium gemmifer</i>	Tier II	Fish	Sharp Sprite	<i>Promenetus exacuus</i>	Tier III	Mollusk
Bonneville Whitefish	<i>Prosopium spilonotus</i>	Tier II	Fish				
June Sucker	<i>Chasmistes liorus</i>	Tier I	Fish				
Least Chub	<i>lotichthys phlegothontis</i>	Tier I	Fish				
Utah Lake Sculpin - extinct	<i>Cottus echinatus</i>	Tier III	Fish				



Species that use ASPEN as primary or secondary habitat.							
Primary		Tier Level	Group	Secondary		Tier Level	Group
Yavapai Mountainsnail	<i>Oreohelix yavapai</i>	Tier II	Mollusk	Northern Goshawk	<i>Accipiter gentilis</i>	Tier I	Bird
				Williamson's Sapsucker	<i>Sphyrapicus thyroideus</i>	Tier III	Bird
				Gray Wolf	<i>Canis lupis</i>	Tier I	Mammal
				Mexican Vole	<i>Microtus mexicanus</i>	Tier II	Mammal

Species that use PONDEROSA PINE as primary or secondary habitat.							
Primary		Tier Level	Group	Secondary		Tier Level	Group
Band-tailed Pigeon	<i>Columba fasciata</i>	Tier III	Bird				
Lewis's Woodpecker	<i>Melanerpes lewis</i>	Tier II	Bird				
Abert's Squirrel	<i>Sciurus aberti</i>	Tier III	Mammal				
Mexican Vole	<i>Microtus mexicanus</i>	Tier II	Mammal				
Many-lined Skink	<i>Eumeces multivirgatus</i>	Tier III	Reptile				

Species that use LOW DESERT SCRUB as primary or secondary habitat.							
Primary		Tier Level	Group	Secondary		Tier Level	Group
Crissal Thrasher	<i>Toxostoma crissale</i>	Tier III	Bird	Lucy's Warbler	<i>Vermivora luciae</i>	Tier III	Bird
Gambel's Quail	<i>Callipepla gambelii</i>	Tier III	Bird	Black-footed ferret	<i>Mustela nigripes</i>	Tier I	Mammal
Desert Kangaroo Rat	<i>Dipodomys deserti</i>	Tier III	Mammal	Yuma Myotis	<i>Myotis yumaensis</i>	Tier III	Mammal
Desert Shrew	<i>Notiosorex crawfordi</i>	Tier III	Mammal	Coachwhip	<i>Masticophis flagellum</i>	Tier III	Reptile
Spotted Bat	<i>Euderma maculatum</i>	Tier II	Mammal	Common Chuckwalla	<i>Sauromalus ater</i>	Tier II	Reptile
Common Kingsnake	<i>Lampropeltis getula</i>	Tier III	Reptile	Glossy Snake	<i>Arizona elegans</i>	Tier III	Reptile
Desert Iguana	<i>Dipsosaurus dorsalis</i>	Tier II	Reptile	Western Threadsnake	<i>Leptotyphlops humilis</i>	Tier II	Reptile
Desert Night Lizard	<i>Xantusia vigilis</i>	Tier II	Reptile				
Gila Monster	<i>Heloderma suspectum</i>	Tier II	Reptile				
Groundsnake	<i>Sonora semiannulata</i>	Tier III	Reptile				
Lesser Earless Lizard	<i>Holbrookia maculata</i>	Tier III	Reptile				
Long-nosed Leopard Lizard	<i>Gambelia wislizenii</i>	Tier III	Reptile				
Mojave Rattlesnake	<i>Crotalus scutulatus</i>	Tier II	Reptile				
Sidewinder	<i>Crotalus cerastes</i>	Tier II	Reptile				
Smith's Black-headed Snake	<i>Tantilla hobartsmithi</i>	Tier III	Reptile				
Speckled Rattlesnake	<i>Crotalus mitchellii</i>	Tier II	Reptile				
Spotted Leaf-nosed Snake	<i>Phyllorhynchus decurtatus</i>	Tier III	Reptile				
Western Banded Gecko	<i>Coleonyx variegatus</i>	Tier II	Reptile				
Western Lyresnake	<i>Trimorphodon biscutatus</i>	Tier III	Reptile				
Western Patch-nosed Snake	<i>Salvadora hexalepis</i>	Tier III	Reptile				
Zebra-tailed Lizard	<i>Callisaurus draconoides</i>	Tier II	Reptile				

Species that use AGRICULTURE as primary or secondary habitat.							
Primary		Tier Level	Group	Secondary		Tier Level	Group
				Bald Eagle	<i>Haliaeetus leucocephalus</i>	Tier I	Bird
				Bobolink	<i>Dolichonyx oryzivorus</i>	Tier II	Bird
				Long-billed Curlew	<i>Numenius americanus</i>	Tier II	Bird
				Yellow-billed Cuckoo	<i>Coccyzus americana</i>	Tier I	Bird

Species that use HIGH DESERT SCRUB as primary or secondary habitat.							
Primary		Tier Level	Group	Secondary		Tier Level	Group
Great Plains Toad	<i>Bufo cognatus</i>	Tier III	Amphibian	Brewer's Sparrow	<i>Spizella breweri</i>	Tier III	Bird
Burrowing Owl	<i>Athene cunicularia</i>	Tier II	Bird	Sage Sparrow	<i>Amphispiza belli</i>	Tier III	Bird
Mountain Plover	<i>Charadrius montanus</i>	Tier III	Bird	Sage Thrasher	<i>Oreoscoptes montanus</i>	Tier III	Bird
Dark Kangaroo Mouse	<i>Microdipodops megacephalus</i>	Tier II	Mammal	Gunnison's Prairie-dog	<i>Cynomys gunnisoni</i>	Tier II	Mammal
Kit Fox	<i>Vulpes macrotis</i>	Tier II	Mammal	Preble's Shrew	<i>Sorex preblei</i>	Tier II	Mammal
Common Chuckwalla	<i>Sauromalus ater</i>	Tier II	Reptile	Spotted Ground Squirrel	<i>Spermophilus spilosoma</i>	Tier III	Mammal
Long-nosed Snake	<i>Rhinocheilus lecontei</i>	Tier III	Reptile	White-tailed Prairie-dog	<i>Cynomys leucurus</i>	Tier II	Mammal
Milksnake	<i>Lampropeltis triangulum</i>	Tier III	Reptile	Wyoming Ground Squirrel	<i>Spermophilus elegans</i>	Tier III	Mammal
				Southern Tightcoil	<i>Ogaridiscus subrupicola</i>	Tier II	Mollusk
				Long-nosed Leopard Lizard	<i>Gambelia wislizenii</i>	Tier III	Reptile
				Nightsnake	<i>Hypsiglena torquata</i>	Tier III	Reptile

Species that use DESERT OAK as primary or secondary habitat.							
Primary		Tier Level	Group	Secondary		Tier Level	Group
				Plateau Striped Whiptail	<i>Cnemidophorus velox</i>	Tier III	Reptile

Species that use MIXED CONIFER as primary or secondary habitat.							
Primary		Tier Level	Group	Secondary		Tier Level	Group
Northern Goshawk	<i>Accipiter gentilis</i>	Tier I	Bird	Band-tailed Pigeon	<i>Columba fasciata</i>	Tier III	Bird
Mill Creek Mountainsnail	<i>Oreohelix howardi</i>	Tier III	Mollusk	Rubber Boa	<i>Charina bottae</i>	Tier III	Reptile

Species that use LODGEPOLE PINE as primary or secondary habitat.							
Primary		Tier Level	Group	Secondary		Tier Level	Group
				Three-toed Woodpecker	<i>Picoides tridactylus</i>	Tier II	Bird
				American Marten	<i>Martes americana</i>	Tier III	Mammal

Species that use PLAYA as primary or secondary habitat.							
Primary		Tier Level	Group	Secondary		Tier Level	Group
Caspian Tern	<i>Sterna caspia</i>	Tier III	Bird	American Avocet	<i>Recurvirostra americana</i>	Tier III	Bird
Snowy Plover	<i>Charadrius alexandrinus</i>	Tier III	Bird	Black-necked Stilt	<i>Himantopus mexicanus</i>	Tier III	Bird

Species that use NORTHERN OAK as primary or secondary habitat.							
Primary		Tier Level	Group	Secondary		Tier Level	Group
Virginia's Warbler	<i>Vermivora virginiae</i>	Tier III	Bird	Gray Vireo	<i>Vireo vicinior</i>	Tier III	Bird
Fringed Myotis	<i>Myotis thysanodes</i>	Tier II	Mammal				

Species that use SUB-ALPINE CONIFER as primary or secondary habitat.							
Primary		Tier Level	Group	Secondary		Tier Level	Group
Boreal Owl	<i>Aegolius funereus</i>	Tier III	Bird				
Three-toed Woodpecker	<i>Picoides tridactylus</i>	Tier II	Bird				
Williamson's Sapsucker	<i>Sphyrapicus thyroideus</i>	Tier III	Bird				
American Marten	<i>Martes americana</i>	Tier III	Mammal				
Dwarf Shrew	<i>Sorex nanus</i>	Tier III	Mammal				
Northern Flying Squirrel	<i>Glaucomys sabrinus</i>	Tier III	Mammal				
Wolverine	<i>Gulo gulo</i>	Tier III	Mammal				

Species that use PINYON-JUNIPER as primary or secondary habitat.							
Primary		Tier Level	Group	Secondary		Tier Level	Group
Mexican Spadefoot	<i>Spea multiplicata</i>	Tier III	Amphibian	Virginia's Warbler	<i>Vermivora virginiae</i>	Tier III	Bird
Plains Spadefoot	<i>Spea bombifrons</i>	Tier III	Amphibian	Allen's Big-eared Bat	<i>Idionycteris phyllotis</i>	Tier II	Mammal
Black-throated Gray Warbler	<i>Dendroica nigrescens</i>	Tier III	Bird	Fringed Myotis	<i>Myotis thysanodes</i>	Tier II	Mammal
Ferruginous Hawk	<i>Buteo regalis</i>	Tier II	Bird	Northern Rock Mouse	<i>Peromyscus nasutus</i>	Tier III	Mammal
Gray Vireo	<i>Vireo vicinior</i>	Tier III	Bird	Common Kingsnake	<i>Lampropeltis getula</i>	Tier III	Reptile
Stephens' Woodrat	<i>Neotoma stephensi</i>	Tier III	Mammal	Cornsnake	<i>Elaphe guttata</i>	Tier II	Reptile
Townsend's Big-eared Bat	<i>Plecotus townsendii</i>	Tier II	Mammal	Desert Night Lizard	<i>Xantusia vigilis</i>	Tier II	Reptile
Ovate Vertigo	<i>Vertigo ovata</i>	Tier III	Mollusk	Western Banded Gecko	<i>Coleonyx variegatus</i>	Tier II	Reptile
Nightsnake	<i>Hypsiglena torquata</i>	Tier III	Reptile				
Plateau Striped Whiptail	<i>Cnemidophorus velox</i>	Tier III	Reptile				
Ring-necked Snake	<i>Diadophis punctatus</i>	Tier III	Reptile				
Sonora Mountain Kingsnake	<i>Lampropeltis pyromelana</i>	Tier III	Reptile				
Western Skink	<i>Eumeces skiltonianus</i>	Tier III	Reptile				

Species that use ROCK as primary or secondary habitat.							
Primary		Tier Level	Group	Secondary		Tier Level	Group
Northern Rock Mouse	<i>Peromyscus nasutus</i>	Tier III	Mammal	Stephens' Woodrat	<i>Neotoma stephensi</i>	Tier III	Mammal
Southern Tightcoil	<i>Ogaridiscus subrupicola</i>	Tier II	Mollusk	Brian Head Mountainsnail	<i>Oreohelix parawanensis</i>	Tier II	Mollusk
				Deseret Mountainsnail	<i>Oreohelix peripherica</i>	Tier II	Mollusk
				Eureka Mountainsnail	<i>Oreohelix eurekaensis</i>	Tier II	Mollusk
				Lyrate Mountainsnail	<i>Oreohelix haydeni</i>	Tier II	Mollusk
				Yavapai Mountainsnail	<i>Oreohelix yavapai</i>	Tier II	Mollusk

Species that use CLIFF as primary or secondary habitat.							
Primary		Tier Level	Group	Secondary		Tier Level	Group
California Condor	<i>Gymnogyps californianus</i>	Tier I	Bird	Black Swift	<i>Cypseloides niger</i>	Tier II	Bird
Mexican Spotted Owl	<i>Strix occidentalis lucida</i>	Tier I	Bird	Big Free-tailed Bat	<i>Nyctinomops macrotis</i>	Tier II	Mammal
Peregrine Falcon	<i>Falco peregrinus</i>	Tier III	Bird	Spotted Bat	<i>Euderma maculatum</i>	Tier II	Mammal
Wet-rock Physa	<i>Physella zionis</i>	Tier II	Mollusk				

Utah CWCS – Appendix L. Key Habitats and Associated Species

Species that use ALPINE as primary or secondary habitat.							
Primary		Tier Level	Group	Secondary		Tier Level	Group
Black Rosy-finch	<i>Leucosticte atrata</i>	Tier III	Bird	Black Rosy-finch	<i>Leucosticte atrata</i>	Tier III	Bird
American Pika	<i>Ochotona princeps</i>	Tier III	Mammal	Dwarf Shrew	<i>Sorex nanus</i>	Tier III	Mammal

## **APPENDIX M . UPCD JOINT RESOLUTION**

### **THE UTAH PARTNERS FOR CONSERVATION AND DEVELOPMENT**

#### ***JOINT RESOLUTION***

#### ***REGARDING THE NEED FOR INCREASED EFFORTS IN MANAGEMENT AND RESTORATION OF SHRUB-STEPPE AND GREAT BASIN SAGEBRUSH ECOSYSTEMS***

The Utah Partners for Conservation and Development understanding the threat of ecological conversion of the shrub-steppe and Great Basin sagebrush ecosystems (hereafter referred to as shrub-steppe rangelands) by noxious weeds and other invasive species, have agreed to the following resolution to recognize the severity of Utah's shrub-steppe rangeland condition and to commit to cooperating in order to develop a common shared vision, improve communication and cooperation among partner members and stakeholders, leverage technical and financial resources and develop innovative approaches to problem solving.

Be it resolved by the Utah Partners for Conservation and Development:

***WHEREAS***, although the federal and state land managing agencies and private grazing land managers have historically coordinated and carried out rangeland restoration activities in Utah, the effort has not kept pace with dynamic changes that are occurring on public and private lands within the shrub-steppe ecosystems;

***WHEREAS***, many of the productive shrub-steppe rangelands have been replaced by cheatgrass (*Bromus tectorum*) or dense stands of pinyon-juniper woodland;

***WHEREAS***, many of Utah's livestock enterprises, and wildlife species of conservation concern, particularly those listed or petitioned for listing under the Endangered Species Act (ESA,) are dependent on healthy shrub-steppe ranges for their survival;

***WHEREAS***, noxious weeds and invasive annual grasses are pervasive on many of these shrub-steppe ranges, setting the stage for an unalterable increase in the frequency of fire and the subsequent loss of productive rangelands for livestock and wildlife;

***WHEREAS***, vast areas within these ecosystems no longer function to provide healthy watersheds, diverse wildlife habitats and/or productive grazing lands;

***WHEREAS***, healthy rangelands are essential in reducing sediment and other pollutant loading to waters of the state;

***WHEREAS***, watersheds dominated by noxious weeds, other invasive species and closed-canopied, pinyon-juniper woodlands lack sufficient herbaceous plant cover to protect soil health and trap, store and slowly release water to springs, streams, lakes and reservoirs;

**WHEREAS**, prolonged drought has contributed to more than 600,000 acres of sagebrush-steppe die-off and has the potential to cause long-term effects to ecosystems and economies;

**WHEREAS**, natural recovery is no longer possible in many areas due to loss of seed reserves in the soil, and the introduction of noxious weeds and other invasive species;

**WHEREAS**, a well-planned, long-term restoration and management program is necessary to prevent the large-scale conversion of diverse, productive rangelands to non-desirable plant species or dense stands of pinyon-juniper woodlands, depending on the fire regime;

**WHEREAS**, rangeland health is a unifying goal that cuts across all economic, social and political boundaries and is important to the quality of life for all in Utah:

**NOW, THEREFORE, BE IT RESOLVED** that the Utah Partners for Conservation and Development will work together and take cooperative action as partners with federal, state and local agencies, tribal governments, non-governmental organizations, private livestock operations and other affected private landowners, communities, and stakeholders to define a common vision and goals for these rangelands; coordinate and leverage technical and financial resources; set priorities for management and restoration; strengthen efforts for monitoring and assessment; develop innovative approaches to problem solving; and develop and implement outreach and educational efforts.

**BE IT FURTHER RESOLVED** that a copy of this resolution be sent to partner members' field offices, county commissions, non-governmental and private livestock agricultural oriented organizations involved in conservation efforts in Utah and members of Utah's congressional delegation.

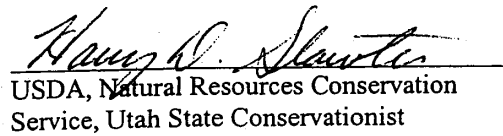


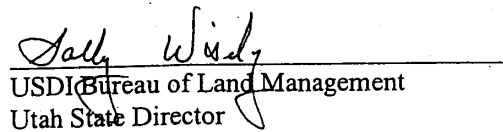
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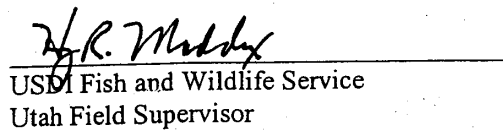
  
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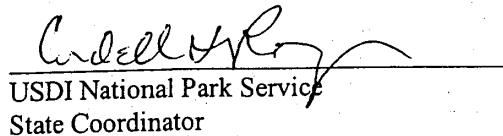
  
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State Committee Chair

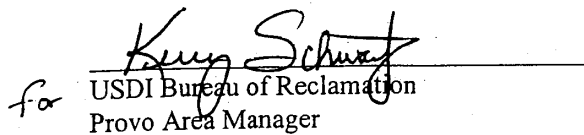
  
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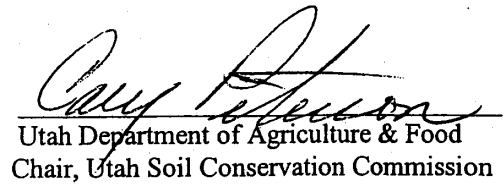
  
USDA, Natural Resources Conservation  
Service, Utah State Conservationist

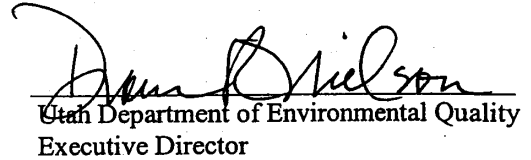
  
USDI Bureau of Land Management  
Utah State Director

  
USDI Fish and Wildlife Service  
Utah Field Supervisor

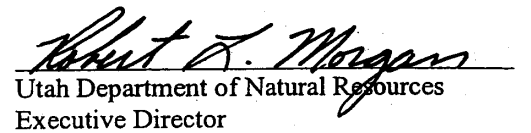
  
USDI National Park Service  
State Coordinator

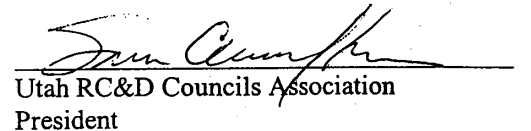
for   
USDI Bureau of Reclamation  
Provo Area Manager

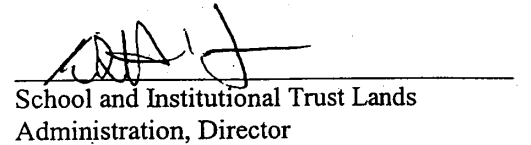
  
Utah Department of Agriculture & Food  
Chair, Utah Soil Conservation Commission

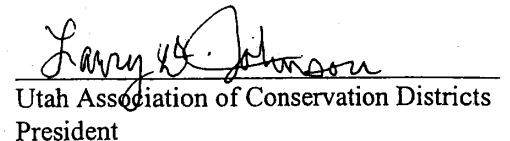
  
Utah Department of Environmental Quality  
Executive Director

  
Utah State University Extension Service  
Vice-President

  
Utah Department of Natural Resources  
Executive Director

  
Utah RC&D Councils Association  
President

  
School and Institutional Trust Lands  
Administration, Director

  
Utah Association of Conservation Districts  
President